Age
1931

The RUBBER AGE

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LATE NEWS of the Industry

United States Rubber Company Loss Reported at $18,063,941 for 1930

OPERATIONS of the United States Rubber Company for the year ended December 31, 1930, resulted in a net deficit of $18,063,941, after all charges and adjustments of inventories, including both raw materials and finished goods. The company reduced the book value of its common stock by writing off the good will and patents account of $58,925,372 and a final deficit at the end of the year of $7,120,056. The net worth of the common stock is now figured at $32,690,182 for the 1,464,371 shares, or $22.32 a share.

The results for the year compare with a net loss during 1929 of $3,378,412 after depreciation, interest, subsidiary dividends and deduction of $2,721,326 for inventory adjustments, $1,490,421 for additional depreciation and $2,464,000 for extraordinary expenses incidental to concentration and reorganization of operations. In 1928 the company showed a net loss of $10,781,255 and in 1927 a net profit of $6,233,792.

Net sales for 1930 were $157,074,760, compared with $192,962,040 for 1929. Operating profit before interest, depreciation and other charges was $6,505,672 as compared to $14,385,814 during 1929.

Current assets amounted to $84,147,643 and current liabilities to $11,729,006, a ratio of 7.17 to 1, on December 31, 1930. At the end of the previous year, the statement showed current assets of $116,752,339 and current liabilities of $37,303,973.

Discussing the report, F. B. Davis, Jr., chairman of the company, said:

"During the year ended December 31, 1930, your company has continued with the reorganization of its general financial and business structure and has carried out many changes in connection with the realignment of its production and distribution activities. It is natural that this has seriously affected the results for the year, but with the return of better business conditions, the benefits to be derived from the reorganization will be evident. Eleven factories were closed during the year and their manufacturing operations were concentrated in more modern units. Four factories were sold and the remainder are being offered for sale or are being rented. Improvements in selling and distributing operations have been made and further changes are in process of completion.

"Provision has been made for the issuance of 100,000 shares of common stock at $35 per share to the trustees of the Managers' Shares Plan, as approved by the stockholders in October, 1929. No distribution of profits under the bonus or managers' shares plans of the company was made during the year, since earnings were not available.

"Expenditures for new buildings and machinery amounted to $8,162,284. Provision for depreciation, amounting to $7,347,183, and sales of properties and disposition of obsolete equipment having a book value of $8,142,614 caused a reduction in the net value of properties, plants and equipment of $7,327,513 for the year. The net value on December 31, 1930, was $94,056,883. On December 31, 1929, it was $101,384,396 and on December 31, 1928, it was $105,098,009.

"All inventories of finished goods, goods in process of manufacture and raw materials, as well as commitments, have been valued at cost or market, whichever was lower. These inventories amounted to $44,050,098 on December 31, 1930, and had been $57,499,934 on December 31, 1929, a reduction of $13,449,836."

Consolidated income account for year 1930 compares as follows:

	1930	1929	1928
Net sales	$157,074,760	$192,962,040	$193,480,121
Operation profit	6,505,672	14,385,814	14,530,711
Net profit U. S. Rubber Plan	.....	.....	.....
Total	$6,505,672	$14,385,814	$14,530,711
Depreciation reserve	7,347,183	5,152,727	5,152,727
Prov. for pensions	540,126	.....	.....
Interest	5,576,790	5,918,063	6,097,546
Loss	$6,958,427	*$3,315,024	*$3,280,438
Other income	.....	.....	†1,000,000
Loss	$6,958,427	*$3,315,024	*$4,280,438
Sub. dividends	21,714	17,689	23,389
Loss	$6,980,141	*$3,297,335	*$4,257,049
Inventory adj.	¶11,083,799	2,721,326	15,038,308
Loss	$18,063,940	*576,009	$10,781,255
Prov. for increased depr.	.....	1,490,421	.....
Extra expenses	.....	§2,464,000	.....
Net loss	$18,063,940	$3,378,412	$10,781,255
Preferred dividends	.....	.....	.....
Deficit	$18,063,940	$3,378,412	$10,781,255

*Profit. †Dividends received from U. S. Rubber Plantations, Inc. ‡Surplus. §Partly estimated extraordinary expenses incident to concentration and reorganization of operations. ¶Includes provision for contingencies.

United States Rubber Consumption Was 28,797 Tons During February

CONSUMPTION of crude rubber by manufacturers in the United States for the month of February is estimated to be 28,797 long tons, an increase of less than 1 per cent over the January consumption of 28,557 long tons, but counter to the usual seasonal decrease of 4 per cent, according to statistics compiled by the Rubber Manufacturers Association.

Imports of crude rubber for February amounted to 36,645 long tons as compared with 37,098 long tons for January, according to the association's own estimates.

The association estimates total domestic stocks of crude rubber on hand and in transit overland on February 28, at 212,833 long tons, an increase of 1.6 per cent over January, and 47.9 per cent over February, 1930. This represents a new peak for stocks in this country.

Crude rubber afloat for United States ports on February 28 is estimated at 63,680 long tons as against 56,188 long tons on January 31, and 63,404 long tons on February 28 a year ago.

B. F. Goodrich Company Surplus Account Showed $16,847,246 Shrinkage in 1930

FINAL reports of the B. F. Goodrich Company for the year ended December 31, 1930, show a net loss of $8,374,148 after depreciation, interest, minority interest and after charging out an amount sufficient to cover the excess of contract prices over market prices at the close of the year on raw material commitments for future delivery. Other deductions during the year, however, combined to bring the company's surplus account down to $8,900,278 as compared with $25,747,524 at the close of 1929.

A write-down of $1,935,320 from cost to market prices of material content of unfinished and finished goods on hand December 31 was charged directly against surplus. Despite the acquisition of the Miller Rubber Company during the year, the total assets of the B. F. Goodrich Company dropped to $159,021,644 as of December 31 from $163,695,965 a year previous. A pro forma balance sheet of the B. F. Goodrich Company after giving effect to the acquisition of net assets of the Miller Rubber Company had shown total Goodrich assets as of December 31, 1929, at $179,953,571.

Surplus account follows: Balance January 1, 1931, $25,747,524; add: Difference between cost and par value of preferred treasury stock purchased for redemption, $465,162; total surplus, $26,212,686; deduct: Loss for year 1930, $8,374,148; preferred dividends paid, $2,228,030; common dividends paid, $2,220,780; dividend credits on employes' stock, $153,150; cost of issuing 15-year 6 per cent convertible gold debentures and sundry adjustments not relating to operations of the current year, $2,400,979; write-down from cost to market prices of material content of unfinished and finished goods on hand at December 31, 1930, $1,935,321; leaving surplus December 31, 1930, $8,900,278.

In a statement to stockholders, J. D. Tew, president, said in part: "Total sales were $155,256,245 compared with $164,494,958 in 1929, or a shrinkage in dollar sales of 5.6 per cent. Due to the acquisition of the Hood Rubber Company and the Miller Rubber Company, the above figures are not on a comparable basis. On a comparable basis, sales for 1930 were approximately 20 per cent below 1929.

"Inventories of raw materials were valued at the lower of cost or market on December 31, 1930, and operations were charged with the difference between cost and December 31, 1930, market prices on all rubber and cotton on commitment at that date. Prior to 1930, semi-finished and finished goods were inventoried at cost. In departing from this policy, rubber and cotton content of semi-finished and finished goods inventories were valued at market prices on December 31, 1930, and a charge was made against surplus to cover the difference between cost and market.

"During the year the manufacture of Goodrich footwear was moved to the Hood plant at Watertown, Mass., and certain mechanical goods items were removed from Watertown to Akron, each move resulting in lower operating costs. The operating results of the Miller and Hood companies for 1930, while not as satisfactory as could be desired, were profitable, and confirm our opinion that under normal business conditions the results to be expected from these two companies will amply justify their acquisition.

"Operating expenses, both in the factory and sales divisions, for the year 1931 will be materially lower than during the year just closed, due to elimination of personnel and more economical operations in all divisions of the business."

Consolidated income account for year 1930 compares as follows:

	†1930	1929	1928	1927
Net sales	$155,256,245	$164,494,957	$148,805,178	$151,684,960
Mfg. expense	154,366,257	151,074,888	139,790,818	132,389,668
Profit	$889,988	$13,420,069	$9,014,360	$19,295,292
Other income	1,262,213	1,903,647	916,808	1,219,602
Total inc.	$2,152,201	$15,323,716	$9,931,168	$20,514,894
Depreciation	6,099,121	3,991,580	3,303,021	3,007,490
Interest, etc.	4,288,583	2,950,591	2,535,567	2,927,098
Federal tax	.....	690,000	433,000	1,800,000
Minority int.	138,645	245,235	146,557	.....
Reserve	.....	.....	.....	*1,000,000
Net loss	$8,374,148	‡$7,446,310	‡$3,513,023	†$11,780,306
Pfd. dividends	2,228,030	2,311,190	2,394,350	2,477,510
Com. dividends	2,220,780	4,036,124	2,950,084	2,406,840
Deficit	$12,822,958	§$1,098,996	$1,831,411	§$6,895,956

*Set up for contingencies and to cover possible losses due to fluctuations in prices of raw materials. †Includes Miller Rubber Co., from February 17, 1930. ‡Net profit. §Surplus.

January Output of 3,674,627 Casings Shows 30.6% Increase Over December

SHIPMENTS of pneumatic casings for the month of January amounted to 3,744,349, an increase of 11.4 per cent over December although 15 per cent under January a year ago, according to statistics released by the Rubber Manufacturers Association.

This organization reports pneumatic casings on hand January 31 as 8,957,307, representing a decline of less than 1 per cent under December 31, but 24.9 per cent below January 31, 1930.

Production of pneumatic casings for the month of January is placed at 3,674,627, an increase of 30.6 per cent over the December figure of 2,814,086. Production for January a year ago amounted to 4,486,077 casings.

Inner tube shipments also exceeded production in January. In that month, there were 3,623,006 inner tubes produced and 4,062,167 tubes shipped, leaving a stock in manufacturers' hands of 9,439,389 tubes. Solid and cushion tire shipments once more exceeded production, bringing stocks down to the lowest level in years.

The tire industry is estimated to have consumed a total of 45,398,725 pounds of crude rubber and 15,923,084 pounds of cotton fabric during the month of January in the manufacture of all types of tires and tubes.

The association's estimates are based on reports furnished by manufacturers who produce approximately 80 per cent of the total for the United States, but have been adjusted to represent 100 per cent in the above figures.

Manville Jenckes Company Receivers to Continue Operation Until Reorganization

A FURTHER step toward the reorganization of Manville Jenckes Company was taken March 10, when the Superior Court of Rhode Island, at the joint request of interests representing the principal stockholders and creditors, appointed Zenas W. Bliss of Providence, R. I., and George R. Urquhart, of Hempstead, L. I., as receivers in Rhode Island to succeed Messrs. Bliss and Dexter Stevens, who have been acting as temporary receivers since February 27, 1931. In the ancillary proceedings pending in North Carolina, Messrs. Bliss, Stevens and John A. Baugh continued to act as temporary receivers until March 20, on which date the North Carolina court was requested to appoint Messrs. Bliss, Urquhart and Baugh as ancillary receivers there.

The receivership proceedings, both in Rhode Island and North Carolina, have been brought for the purpose of facilitating a reorganization of the affairs of the company and it is anticipated that such a reorganization will be effected without undue delay. The interests affected are working harmoniously to this end. Accordingly, the receivers have been given broad powers to continue operation of the company's mills (including plants of subsidiary companies) with express power to complete pending orders, to accept and fill new orders for future delivery and in general, to preserve the company's good will and to carry on its business as usual.

There has been no suspension of the company's business and new orders of substantial amount, both for immediate and future delivery, have been accepted by the receivers. The company has unfilled orders on its books aggregating approximately $2,500,000 and the entire output of several of its properties have been sold for a considerable period in advance. Arrangements have been made with responsible banking interests to furnish the receivers with adequate working capital.

The operation of the company will continue under the direction of Dexter Stevens, president.

Intercontinental Rubber Company Had Net Loss of $303,692 in Year of 1930

FOR the year ended December 31, 1930, the Intercontinental Rubber Company and subsidiaries have reported a net loss of $303,692 after expenses, depreciation, and inventory adjustment reserve, comparing with a net loss of $87,914 in 1929. The company showed an operating loss before charges of $33,930 as against an operating profit of $97,639 in the preceding year.

The surplus account of the company declined to $688,422 as of December 31, 1930, from the figure of $1,008,844 a year previous. Total assets amounted to $7,124,413 as against $7,472,184 at the end of 1929, the decline being chiefly in cash on hand, marketable securities, and call loans. Due to the construction of the new guayule factory near Salinas, Cal., and other improvements, the value of the company's land, buildings and equipment increased to $5,329,768 from $4,857,723 at the close of 1929.

"The loss sustained for the year," stated George H. Carnahan, president, "is entirely due to the unprecedented depression in all crude rubber prices, together with the necessity of maintaining our productive units and safeguarding our large property holdings against the time when prices will again reach remunerative levels. Attention is called to the reserve of $30,109 that has been set up to cover the difference between the cost of rubber inventory and market value as of the end of the year."

The consolidated income account of the Intercontinental Rubber Company and subsidiaries for the year of 1930 compares with the three previous years as follows:

	1930	1929	1928	1927
Oper. loss	$33,930	*$97,639	*$427,091	*$923,327
Other income	91,411	146,617	132,296	102,752
Total inc.	$57,481	$244,256	$559,387	$1,026,079
Exp. etc.	193,633	192,959	202,330	126,371
Depreciation	137,431	139,211	138,666	134,642
Inv. adj. res.	30,109	.....	.....	.....
Fed. taxes	.....	.....	28,043	106,000
Net loss	$303,692	$87,914	*$190,348	*$659,066
Dividends	.....	.....	148,814	594,845
Deficit	$303,692	$87,914	†$41,534	†$64,221

*Profit. †Surplus.

Kelly-Springfield Tire Company Names W. H. Lalley of Detroit as President

DIRECTORS of the Kelly-Springfield Tire Company, meeting on March 16, elected William H. Lalley, Detroit banker and industrialist, as president to succeed Samuel Woolner, Jr., who recently resigned. Although Mr. Lalley is a new figure in the tire industry, he has been for more than seventeen years closely associated with several branches of the automotive industry and with banking interests intimately affiliated with it.

W. H. LALLEY

"Mr. Lalley," says a statement by the company, "brings to Kelly a thorough knowledge of the organization and merchandising problems confronting the automotive and related industries, and a record of exceptional achievement."

M. B. Muxen, president of the Tokheim Oil Tank & Pump Company, was elected chairman of the board of directors, and J. K. Newman, president of Newman, Saunders & Company, Inc., was chosen to act as chairman of the executive committee. Other members of the executive committee, in addition to Mr. Muxen and Mr. Newman, are Frank Wilbur Main, of Main & Company; W. M. Flook, president of the American Brown Boveri Electric Corporation; and John Hancock, of Lehman Brothers. Louis Mueller was elected as first vice-president.

India Tire Not British-Controlled

IN THE news article on the 1930 financial report of the India Tyre & Rubber Company (Great Britain), Ltd., published on page 556 of the March 10 issue of THE RUBBER AGE, a statement was made that it was understood that the British interests now control the India Tire & Rubber Company of Akron, O. These reports are incorrect, according to the India Tire & Rubber Company, as the Akron organization is not in any sense British-controlled.

Questionnaires are now being mailed to tire dealers through the country by the Department of Commerce for the semi-annual survey of tires and tubes on hand as of April 1. Two reports will be issued in this survey, the first on or about April 15 and a final report at the end of April.

(Other news of the industry will be found on Pages 619-625)

RESEARCH *and* CONTROL

Weighing Out Exact Quantities of Materials for Compounding

A SURVEY of American industries indicates in a fashion beyond contention that the race is to those who are swift in the development of new methods, processes and products. A large number of manufacturing enterprises which are predominant in their fields owe their success to exceptional shrewdness and foresight in these matters.

In most cases success has been assured by the establishment of special departments to control processes and investigate possible improvements. The function of such a research division is as generally conceived: (1) To develop new methods leading to economy of production and to develop the product to a higher state of perfection thus defeating competition from within the industry and from without. (2) To develop new uses for the product or to develop by-products which will invade other fields. This results in the lowering of production costs and the diversification of product. (3) To survey the advances made in other fields and adapt the new knowledge where possible to the problems of the industry.

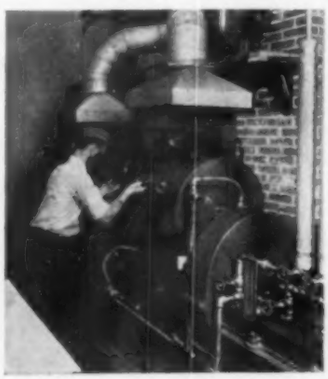
Due to a successful experience of some years and a rapidly expanding production, it was concluded by the United Carbon Company that facilities for research and control of product should be increased to assure continued importance in the field of carbon black manufacture.

A program of construction has been planned for a series of research and control laboratories. The control laboratory in Charleston, West Va., is a model rubber laboratory designed to give the greatest output with the least expenditure of effort. The building built by Roush Brothers, contractors of Charleston, is one story in height and, as indicated on the floor plan, the dimensions are 42 x 80. It will be noted that extreme economy of space has obviated waste in the matter of hallways. Each section of the laboratory opens directly off the office. The north side of the building is devoted entirely to rubber testing equipment. At the extreme rear is a sample storeroom. From this storeroom the stock moves directly to the compounding room. This room is well lighted and equipped with highly accurate and efficient scales and balances (Smith Exact Weight Scale Company, The Torsion Balance Company).

Albertoni-Vogt Tensile Testing Machine Which Draws Automatically a Complete Stress Strain Curve of Any Test Stock

Zinc topping on the tables makes it possible to keep the laboratory clean and shipshape. Convenient bins and cabinets provide pleasant working conditions for the operator.

From the compound room the weighed batches are conveyed to the mill room. This department is provided with the most modern milling equipment obtainable. The front and rear rolls of the mill are driven by individual variable speed D.C. motors. This makes it possible to change the speeds and friction ratios at will. A thermostatically controlled tank furnishes water to the mill at any temperature desired. The Banbury mixer on the same mill line is also variable in speed. Current is obtained from a motor generator set which in addition furnishes current for arc lights and other devices in the laboratory. This layout represents the latest development and the greatest flexibility now obtainable in laboratory mills.

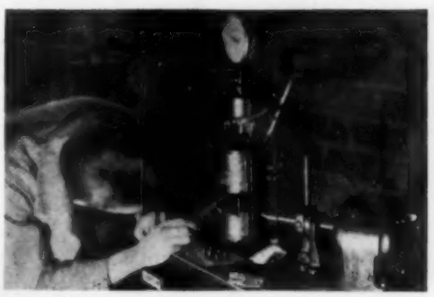


Mill and Banbury Mixer Equipped with Variable Speeds

In the mill room are located the air compressor and scrubbers for removal of moisture, oil and dust. Batches which have been milled are cut to proper sheet size upon the clicking machine (United Shoe Machinery Company) and stored in the conditioning room for 24 hours prior to curing. The conditioning room is held at constant temperature and humidity by a Carrier air condition system. This equipment makes it possible to duplicate test conditions upon rubber, paints and inks to a nicety not previously possible. The conditioned test pieces are cured in a hydraulic steam press built by the Adamson Machine Company. This press is of the drilled steel platen type and uses oil for the hydraulic medium. The temperature is accurately controlled by a Tycos double duty system. The hydraulic system is designed so as to give rapid closing and opening of the press, automatic application of hydraulic after the press is closed and maintenance of pressure at any point up to 2000 pounds without continuous use of power. Directly back of the operator is a steel table care-

Laboratories *of* UNITED CARBON CO.

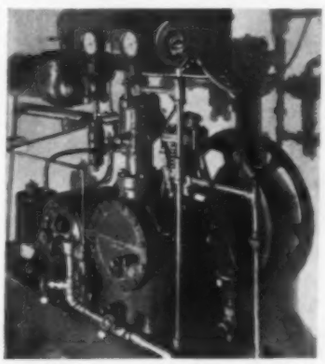
Expansion of Experimental Facilities Together With the Equipping of Field Control Laboratories is Evidence of the Faith of This Company in Organized Research and Development.



Goodrich Plastometer Used in Making Plasticity Tests on Rubber

fully adjusted in height to make the work of the pressman as light as possible. A small sink with running water makes it possible conveniently to quench the cured sheets immediately after removal from the press. They are then stored in the conditioning room preparatory to testing.

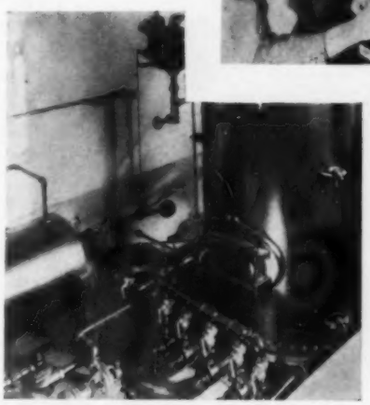
The testing room is equipped as is customary with an abrasion machine, Grasselli type, hardness tester (Olsen) and a tensile testing machine. This latter was designed by Dr. Albertoni, working with Mr. Vogt in the Goodyear laboratories.



Ammonia Unit for Carrier Air Conditioning Apparatus

The machine automatically draws a complete stress strain curve of any given test stock thus reducing experimental error to a minimum and insuring accurate duplication of results.

The constant temperature room also contains aging and conditioning racks and is spacious enough to accommodate some further testing apparatus.

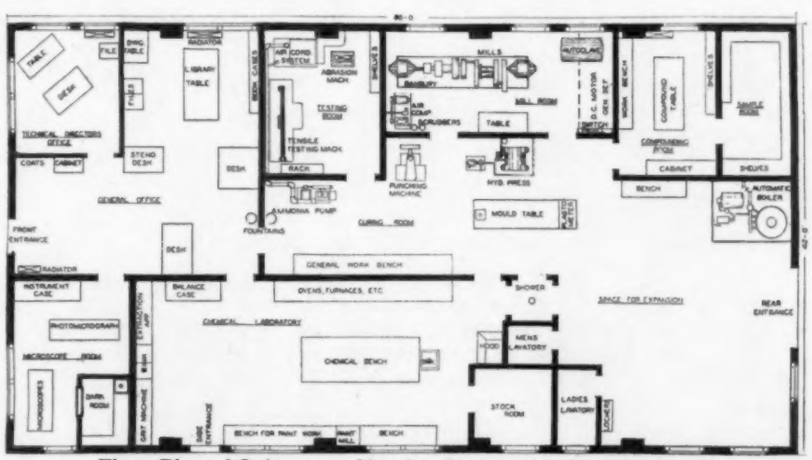


Boiler for Furnishing Steam to the Presses and Water Tank and Heat for Vapor System in Winter

On the opposite side of the building at the front is located the division for microscopic research. The equipment for this work was supplied by the E. Leitz Company. The department is equipped with a compact dark room for development of photographs and for optical work. Just in the rear of the microscopic room is the general laboratory. This is a spacious well-lighted room where routine testing of ink and paint is conducted and where general analytical and research work is done. The laboratory furniture was supplied by Petersons and Kewanee Manufacturing Company. The laboratory is equipped with high-grade balances furnished by C. Becker, drying ovens, muffle furnaces, vacuum pumps and above all a well-lighted and fan drafted fume hood.

The paint testing department is equipped with appropriate paint mills (Kent Mill Company) and general testing equipment. There is a well lighted stock room opening off the laboratory. Just to the rear of the laboratory is located the shower. Since most of the workers in this laboratory handle carbon black in larger or smaller quantities a shower at the end of the day is a necessity.

Aside from space occupied by laboratories, the rear portion of the building is vacant and insures proper room for expansion and the installation of additional equipment. In one corner of this reserve space is the boiler which furnishes steam for the press and water tank and heat for a vapor system in winter. The boiler, supplied by the Eclipse Fuel Engineering Company, is completely automatic and requires practically no attention.



Floor Plan of Laboratory Showing Layout and Arrangement of Equipment—Size of Floor Space is Approximately 42 x 80 Feet

Russian Rubber

A NUMBER of scientific expeditions sent out in search of rubber-bearing plants have recently discovered various plants of this kind which by their rubber contents rival even the well-established rubber plants.

Two of these plants, known as *hondrilla* and *tau-sagyz*, possess particularly high percentages of rubber.

The full extent of the *hondrilla* and *tau-sagyz* resources of the country has not yet been established. According to entirely incomplete data there are about 100 million bushes of *hondrilla* and 80 million bushels of *tau-sagyz* in the USSR. These are estimated to contain about 30,000 tons of pure rubber.

This year five big rubber plantations, four of *hondrilla* of 25,000 hectares and one of *tau-sagyz* of 5,000 hectares, have been established. In mountainous Karabakh (Transcaucascia) a scientific station has been opened for the culti-

Upper: Bushes of the Rubber Bearing Plant *Tau-sagyz* in the Kora-Tau Mountains in Kazakstan

Center: Root of the Rubber Bearing Plant *Tau-Sagyz*

Lower: Plantations of *Hondrilla* in the Sands of Kara-Kum

vation of *guayule*. During this year this station raised more than 2 million *guayule* seeds; by next spring about 20 million *guayule* seeds will be sown in the plantation of the station.

The first factory for the production of rubber from *tau-sagyz* is now being built and will shortly be completed. In 1931 another 8 factories to work over *tau-sagyz* and four factories for the extraction of rubber from *hondrilla* will be built.

The first consignment of rubber produced from the Soviet rubber plants will be turned over to industry next November.

Rubber Varnishes

A NUMBER of methods for using rubber as a constituent of varnishes are reviewed in a recent issue of *Les Matières Grasses* and abstracted in the *Oil and Colour Journal*, of London. For instance, Miller proposes the following: 5 parts of rubber are cut into small pieces and softened in 2½ parts of sulphuric ether, and dissolved therein by heating. When complete solution has been obtained, 2½ parts of warmed varnish are added, followed by 5 parts of turpentine. Winkler dissolves 6 parts of rubber in 12½ parts of turpentine and 15 parts of thick standoil. To the solution obtained is added 30 parts of warmed copal varnish. Fischer and Schoneberg have taken out a German patent for preparing rubber solutions. They propose as a solvent symmetrical dichlorthylene CH CL–CH Cl, which has more powerful solvent properties than either chloroform or tetrachlorethane. It gives limpid solutions, and, of course, the solvent is non-inflammable. Degen and Kuth prepare rubber solutions in the vulcanized state, and use them directly.

Rubber solution, as for example, in carbon tetrachloride, is treated cold with a solution of iodine in the same solvent. Rubber also dissolves at high temperatures in linseed oil, but the products are viscous. This defect is said to be overcome by the process patented by Zuhl and Eisenmann. The rubber is first dissolved in a solvent volatile in steam, mixed with a non-volatile solvent, and steam distilled. The rubber remains in the non-volatile solvent. Thus, rubber is dissolved in naphthalene, benzene, etc. Resins and oil are added, and the naphthalene removed by steam distillation.

In another method, rosin and rubber previously dried at 70-80° C. are melted together, and while liquid, zinc oxide or other mineral pigments added, followed by a copal varnish, or a varnish consisting of 50 parts of rosin dissolved in 40 parts of alcohol. The syrupy mass is milled and thinned out with rosin varnish. This varnish is said to be practically unaffected by acids and water. 10 parts of rubber are swollen in 5 parts of linseed oil fatty acids, and the mass heated with boiled linseed oil until complete solution is obtained. Another method consists in dissolving a mixture of copal and rubber in one of the usual solvents and the solution heated with sulphur. The varnish so prepared withstands a temperature of 170° C. without softening or cracking.

Census of the Suspenders, Garters and Other Elastic Woven Goods Industry

MANUFACTURERS of suspenders, garters, and other elastic woven goods sell principally to wholesalers. Of the total sales in 1929 amounting to $30,366,000, 52.9 per ecnt, or $16,054,000, was made in that way. The remaining sales were made as follows: 42.6 per cent, or $12,942,000, to retailers, and 4.5 per cent, or $1,370,000, to industrial consumers. Of the total sales, 3.5 per cent, or $1,051,000, was made through manufacturers' agents, selling agents, brokers, and commission houses.

In addition to the sale of suspenders, garters, and other elastic woven goods made by the 91 establishments engaged primarily in the manufacture of these commodities, the census report includes the sale of $5,218,000 worth of secondary products made in this industry.

Statistics relative to the 1929 production of this industry showing quantity and value for suspenders, men's garters and hose supporters, women's garters and hose supporters, arm bands, and other facts on this industry are contained in the preliminary report of the Census of Manufactures, 1929, issued December 31, 1930.

Use of Vulcanized Rubber Waste as a Fixing Agent in Bronze Printing

Makes Highly Effective Bonding Solution in Printing on Cloth, Rayon and Other Fabrics—Can Also be Used on Papers, Cardboards and Veneers—Resilliency and Protective Properties Are Additional Advantages

By GEORGE RICE

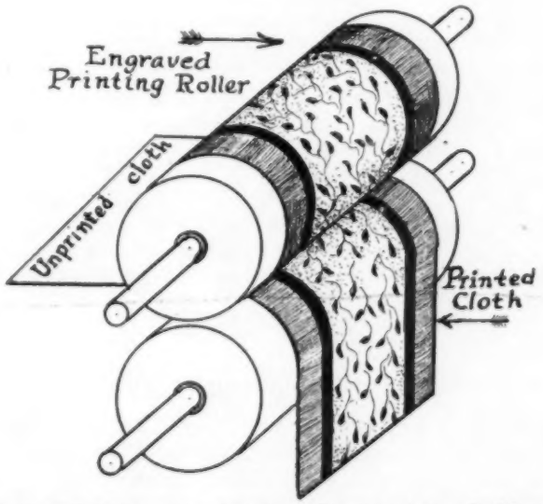
THE use of vulcanized rubber waste, dissolved with camphor oil and naphtha, as a fixing agent when printing or otherwise impressing decorations on fabrics, paper surfaces, thin sheets of wood, and synthetically manufactured products like wall boards, has been on the increase within recent years because of the adaptability of the prepared rubber solutions for this purpose. The rubber does not stiffen the decorated or ornamented surfaces in the way as did some of the old time cellulose esters, specially prepared varnish and lacquer. There is considerable resilliency in the rubber solution as well as protective agencies that tend to ward off decomposition, invasion by mildew bacillus, rust and similar deteriorating influences. The efficiency of a fixing substance when used as a bond and adherence depends upon its ability to retain its form and smoothness as well as its capacity to make the alloy dusts stick. The interior decorators are using considerable wall cloth instead of wall paper at present, and this wall cloth is a cotton or linen sheeting on which beautiful and permanent colored designs can be produced with the metal alloys, provided when the right kind of an adhering material is used to keep the pulverized substances in place, regardless of sweating walls and other condition that might cause colors to bleed and run. The alloy dusts are presumably the products of real gold, silver, bronze or of other precious metals and often they are. More frequently powdered brass, or the ground metal wastes of the jewelry manufacturing establishments compose the surfacing compound.

Effectiveness of Rubber Solutions

But the flyings and the sweepings of the goldsmiths' shops are always rich in metals that look well when applied to surfaces for decorative purposes by means of spray guns operated by compressed air, by hand-cut stencils or by the ordinary method of printing designs on cloth or paper in continuous rolls. Frequently pure gold and silver dust is plentiful in the mixture of dust and the fine particles of these metals sparkle in the lights and shadows. But it is all referred to as bronze printing, a process which has been known to the artisans for a long time, and has been accomplished by causing metallic particles to adhere to surfaces by means of glutinous substances which sometimes decomposed and created an odor. One of the albumen solutions, which usually gave good service, has been found to lack the favorable properties of the rubber solutions as a fixing medium for a material possessing the fine, but brittle like properties of metal dust, because of its tendency to harden under certain conditions and cause splits in the surface structure.

Bronze printing, with a rubber solution as the fixing agent, is practicable on paper, cardboard, veneers of wood, artificially manufactured products like rayon and even metals. But its most extensive use at present appears to be in connection with the production of modern artistry on wall coverings which are made of cloth, and on duck which is intended for colorful awnings for store fronts and residences. We have also seen some window shades handsomely printed with geometric forms, representations of flowers and bird life, in which the powdered gold, silver or other metal is fastened on with a rubber solution in lieu of the adhering agents which were used formerly.

The hammered gold or silver leaf was formerly used for decorating textiles and papers, that part which had to be held in place to form the pattern being fixed with a glutinous substance, thus allowing the part of the leaf not required to be removed. These leaves are now beaten and rubbed into a powder and applied only where required to shape the pattern. Sometimes they are put on in their natural colors and sometimes they are dyed with colors specially prepared for this purpose. The appearance and durability of finished product depends more upon the adhering substance than is generally supposed. We examined a number of excellently designed wall fabrics which were already assuming a faded and loose appearance because of



Bronze Printing on Cloth or Paper with a Rubber Solution as the Fixing Agent is Accomplished with One or More Rollers Engraved Intaglio Fashion

incompetent bonding. The rubber compound usually is composed of new rubber, reclaimed rubber, mineral rubber, or rubber which has good stability. Old tires from the junk yards make good bonding solution for bronze printing if the stock is normal and has enough fresh rubber mixed with it to give it stability.

An analysis which was made of some wall cloth from which the designs were coming off where rubbed by clothes or furniture, proved that the rubber solution had been made from discarded rubber-coated automobile tops. It looked as if artificial leather had been ground to a powder condition and had been mixed in with the rubber solution. The bonding capacity of this solution was practically nil, which accounted for the deteriorated condition of the designs on the wall fabric.

One method by which the bronze printing is done with a rubber solution as the fixing agent consists in dissolving vulcanized rubber waste with a mixture of camphor oil and naphtha in a temperature sufficient to produce the necessary liquid state. Copal varnish is used as a diluting substance and then the prepared metal dust is added and thoroughly mixed by stirring. Evaporation begins almost immediately after the mixture is made, which will eventually cause the solution to thicken and become too stiff for successful use unless some benzine or similar substance is added for neutralizing purposes and to give the combination a proper balance. The mixture is now ready to put into the feeding tanks of the printing presses where its delivery to the printing rollers is effected on the same plan as when the coloring materials are fed to the printing rollers of calico and wall paper printing machines. Instead of a color paste being delivered from the feeding tanks to the engraved rollers, a rubber solution in which gold, bronze, silver or other metals predominate in a paste-like form constitutes the printing material. These rollers, of which there may be one or more, are engraved intaglic fashion, and arranged so as to print the design with which they are engraved on the cloth or other smooth surfaced body which is in process of being drawn in a continuous state through the machine. A separate roll is required for each color or different kind of substance applied. Hence, a single pattern of wall cloth may be composed of part gold and part silver or bronze for decorative purposes.

The printed material is passed over drying cylinders so as to fix and harden the mixed metal dust and rubber solution firmly in place before subjecting it to the regular steaming, soaping and washing operations which are necessary to give the proper finish to the goods and make the printed patterns permanent. What proportion of the applied solution with its composition of gold or silver dust is going to rub off must be removed before the goods go out. Any tendency to gumminess as a result of an abnormal condition of the rubber solution usually is effectually removed by running the material over hot cylinders. A valuable characteristic in bronze printing with a rubber solution as the fixing agent is that the finished cloth or paper is augmented in pliability and can be bent around curves and into corners without danger of breaking or cracking as is the case sometimes when other kinds of bonding and adhering material are used.

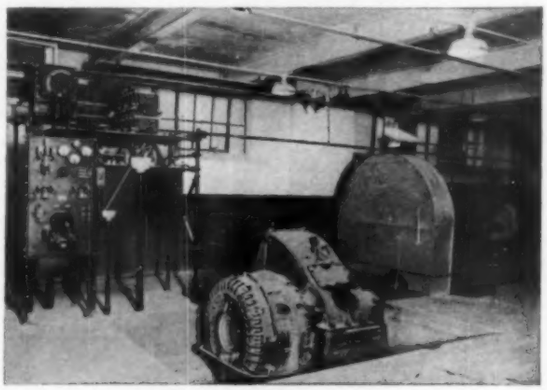
German Tire Exports 1930

DURING the calendar year 1930 Germany exported 302,122 automobile casings as compared to 301,339 in the calendar year 1929. Inner tubes exported from Germany during the calendar year 1930 amounted to 244,694 as compared to 250,762 in the same period of 1929. Germany exported 6,712 solid tires during the calendar year 1930 as compared to 13,388 in the calendar year 1929.

An interesting feature of Germany's tire export trade is that British India supplies the best market with the Argentine ranking second, followed closely by Czechoslovakia and the Dutch East Indies.

Unique Synchronous Motor Drive

AN efficient and economical rubber mill drive was recently installed by the Gillette Rubber Company, Eau Claire, Wisconsin. Three pairs of mixing rolls are driven by means of a 250 hp., 720 rpm. synchronous motor in combination with a gear reduction unit transmitting power to the lineshaft at 90 rpm. The unique feature of the drive is that the usual motor bearings and flexible couplings are eliminated by overhanging the rotor of the motor directly on the extended pinion shaft of the



gear unit. This simplified assembly results in a considerable saving of floor space as compared with a coupled drive. The gear unit is of the single helical type, equipped throughout with tapered roller bearings of liberal capacity. A combination geared motor drive of this type is not only applicable in rubber mills but can also be efficiently applied in many other industries.

The motor is controlled by means of a full voltage starter which embodies a dynamic braking contactor for bringing the motor to a quick stop in case of an accident. In an emergency, the operator trips a safety switch which brings the motor to a quick stop, with only a few inches of travel on the surface of the roll. The equipment was furnished by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

Movies Promote Golf Ball Sales

THE United States Rubber Company is using two sound movie films as a publicity stunt in presenting the features of the new "U. S." golf ball, before a series of meetings for golf professionals in about forty leading cities. The meetings are arranged by the golf ball division of the company and are generally presided over by E. C. Conlin, manager of golf ball sales, or J. W. Sproul, assistant manager.

The motion picture program begins with "The Gift of the Jungle," a one-reel version of the company's plantation film. Next comes "The Inside Story of a Golf Ball," in which every step in the manufacture of a "U. S." golf ball is shown. Finally comes another talkie entitled "Pros, Players, and Profits," which is a little play that shows how important good business methods are in conducting a pro shop.

Rubber Chemists Plan Big Program at Indianapolis Meeting

Will Hold Two Morning Sessions—Twelve Papers to be Presented Touching a Wide Range of Rubber Chemistry Problems—Rubber Division Headquarters Will Be the Severin Hotel

AT THE spring meeting of the American Chemical Society, to be held in Indianapolis, March 30-April 3, an elaborate program is scheduled for the Rubber Division, embracing the presentation of 12 papers on a variety of subjects pertinent to the present problems in rubber chemistry. The program of the Rubber Division calls for two morning meetings, April 1 and 2, at the Severin Hotel. The principal headquarters of the Society, however, will be at the Claypool Hotel.

The program of the Rubber Division and abstracts of the papers to be presented are given below:

ABSTRACTS

The Effect on Vulcanized Rubber Compounds of Immersion in Boiling Water

K. J. SOULE

SINCE vulcanized rubber finds many industrial applications in contact with, or immersed in hot water, a study of its behavior in boiling water seems of considerable interest. In this work it is shown that some rubber compounds are continuing to absorb water and swell after 10,000 hours' immerion in boiling water, without showing any signs of disintegration. It is shown that various fillers have different effects on the water absorption. Of the thirty-five fillers tested, twelve decrease the water adsorption and twenty-three increase it. Carbon black shows the lowest absorption and ultramarine blue the highest.

A determination has been made of the loss of cutting resistance brought about by prolonged immersion in boiling water. While there is not perfect agreement between the amount of water absorption and per cent cutting resistance loss, in general the stocks having the lowest water absorption show the least loss in cutting resistance, and vice versa.

Some Properties of Carbon Black (1) Adsorption

W. B. WIEGAND AND J. W. SNYDER

THE D. P. G. or similar absorption test, although correlating better than the volatile matter test, is not as yet capable of predicting with precision the rubber compounding behavior of standarl (rubber) carbon black. Carbon black adsorption is much more marked in the alkaline than in the acid range. While heat-activated carbon blacks show a marked decrease in D. P. G. adsorption, heat-deactivated carbon blacks show greatly reduced alkaline and slightly increased acid adsorption, which probably explains the anomalous iodine adsorption of heated blacks noted in the literature. In litharge compounds containing an excess of added fatty acid both heat-deactivated and high-adsorption blacks improve the cure, doubtless through removal of excess acid. For entirely unaccelerated rubber mixings heat-deactivated (low adsorption) carbon black exhibits striking improvement in physical properties. The adsorptive properties of carbon blacks have been turned to advantage in the field of rubber insulation and of insulating oils. High adsorption, high oxygen, heat-activated carbon blacks are shown to advance the cure of rubber mixings vulcanized with midinitro-benzene. Specially activated carbon blacks have been developed which show a higher (alkaline) adsorptive effect than the active chars now on the market.

Program of the Division of Rubber Chemistry

H. A. WINKELMANN, *Chairman*
H. E. SIMMONS, *Secretary-Treasurer*
JOHN E. CADY, *Local Assistant*
Rainbow Room, Severin Hotel

Wednesday Morning, April 1

1. 9:30—K. J. Soule. The Effect on Vulcanized Rubber Compounds of Immersion in Boiling Water.
2. 9:55—W. B. Wiegand and J. W. Snyder. Some Properties of Carbon Black. I. Adsorption.
3. 10:15—E. O. Dieterich and J. M. Davies. Scorching and Other Plasticity Changes in Rubber Compounds on Heating.
4. 10:40—M. J. DeFrance and W. J. Krantz. The Value of Softeners in Tread Stock.
5. 11:00—Recess. Sale of Banquet Tickets.
6. 11:10—R. P. Dinsmore. Report of Physical Testing Committee.
7. 11:20—H. L. Trumbull. Report of Papers Committee.
8. 11:30—H. W. Greenup. Effect of Various Factors upon the Rate of Deposition of Latex on Porous Molds.

11:50—Adjourn.

Wednesday Evening, April 2

6:00—Banquet. S. L. WELLER, J. E. CADY, AND E. R. WAITE, *Committee*

Thursday Morning

9. 9:30—Thomas Midgley, Jr., Albert L. Henne, and Mary W. Renoll. Natural and Synthetic Rubber. VIII—The Solubility Fractionation of Natural Rubber.
10. 9:50—V. N. Morris. Permeability of Rubber to Air. II—Effect of Stretch, Thickness, Milling, Compounding Ingredients, Kind of Crude Rubber, and Temperature of Vulcanization.
11. 10:15—C. W. Sanderson. Value of Rubber Hydrocarbon in Reclaimed Rubber.
12. 10:35—Charles W. Stillwell and George L. Clark. An x-Ray Diffraction Study of Chicle.
13. 10:55—Charles W. Stillwell and George L. Clark. Further x-Ray Studies of Gutta Percha and Balata.
14. 11:15—S. D. Gehman and J. S. Ward. A Microturbidimeter for the Determination of the Rubber Content of Latex.
15. 11:35—Henry F. Palmer, George W. Miller, and John E. Brothers. The Effect of Scrap Drying Temperature upon Reclaimed Rubber Quality.
16. 11:55—Business meeting.

Scorching, and Other Plasticity Changes in Rubber Compounds on Heating

E. O. DIETERICH AND J. M. DAVIES

A METHOD is described which employs the Goodrich plastometer for detecting the initial stages of vulcanization of uncured rubber compounds. Reduction in plasticity, at standard room tem-

perature, of test pieces previously heated for various intervals at selected temperatures is used to determine the degree of cure and thus to estimate safe operating temperatures and periods. Examples of the application of the method to a variety of compounds are presented. Other temperature effects, such as heat stiffening and softening, which have not previously been reported, are illustrated.

The Value of Softeners in Tread Stock

M. J. DeFrance and W. J. Krantz

THE effect of three common softeners on the wearing qualities of tire treads is shown and comparison of road-wear ratings is made with the common laboratory tests. The effect of any quantity of either pine-tar or mineral rubber is to decrease the road-wear resistance. An optimum ratio of 4 per cent stearic acid is shown to give the best tread wear. The common laboratory tests give results in the same direction as the average road wear with the 30 per cent slip abrasion test giving the best agreement.

Effect of Various Factors Upon the Rate of Deposition of Latex on Porous Molds

H. W. Greenup

THE effects of pressure, rubber concentration of latex, temperature, and hydrogen-ion concentration upon the rate of deposition of latex on porous molds are described. Pressure, rubber concentration, and temperature were found to be negligible factors in comparison with hydrogen-ion concentration. By adjusting the pH of the latex to 6.1, it was found possible to obtain aggregation of the latex particles and a marked increase in rate of deposition.

The Solubility Fractionation of Natural Rubber

Thomas Midgely, Jr., Albert L. Henne, and Mary W. Renoll

THE paper describes a method of separation of the pure, nitrogen-free rubber hydrocarbon from crude rubber, using a benzene-alcohol mixture as solvent, and obtaining fractions by alternately cooling and redissolving. By repeating the process of solution and precipitation several times, absolutely nitrogen-free rubber is obtained. The final fraction contains the protein in concentrated form. Temperature-solubility diagrams for nitrogen-free rubber, crude rubber, and synthetic rubber (sodium rubber) are included.

Permeability of Rubber to Air. II. Effect of Stretch, Thickness, Milling, Compounding Ingredients, Kind of Crude Rubber, and Temperature of Vulcanization

V. N. Morris

IN continuing the previous study of the effects of various factors on the permeability of rubber to air it has been found that permeability varies inversely with thickness, and with the volume of compounding ingredients present. Factors having little or no influence on permeability include milling, kind of crude rubber used, and temperature of vulcanization.

The permeability of rubber was found to increase with stretch, the major factor involved probably being the accompanying reduction in thickness. The applicability of certain of these results to the improvement of the air-retaining capacity of automobile inner tubes is obvious.

Value of the Rubber Hydrocarbon in Reclaimed Rubber

C. W. Sanderson

THE rubber hydrocarbon of reclaimed rubber is evaluated by road tests in a series of stocks using constant composition as derived from analysis of the reclaim. The hydrocarbon from reclaim is at its maximum value in the 100 per cent reclaim stock where the abrasion is 50 per cent as good as the all new rubber stock. It is not possible to compensate for the degrading effect of the reclaim because any method proposed can also be applied to the non-reclaim stock with corresponding improvement.

An X-Ray Diffraction Study of Chicle

Charles W. Stillwell and George L. Clark

A COMPARATIVE study of the ex-ray diffraction patterns for whole chicle, both crude and refined, and for the several fractions into which chicle may be conveniently separated brings out the following facts:

1. Whole crude chicle is a mixture of at least three crystalline constituents—the gutta, the resin, the "benzene insoluble"—and one or more amorphous fractions.

2. Refined chicle is essentially the same in structure as is crude chicle, except that the gutta is probably highly dispersed and amorphous.

3. Calcium oxalate monohydrate exists in chicle as such and is the crystalline constituent of the "benzene insoluble" fraction.

4. Chicle gutta is identical with gutta percha and balata, its exact nature depending on how one interprets the facts relating to the last two.

5. The structural units of chicle do not assume a preferred orientation under tension, and chicle differs in this respect from rubber

Further X-Ray Studies of Gutta Percha and Balata

Charles W. Stillwell and George L. Clark

NEW x-ray diffraction data for gutta percha and balata are given and considered in the light of V. Susich's recent conclusion that gutta percha and balata are identical and exist in two crystalline forms. The data also support the assumption that gutta percha is a mixture of balata and another crystalline constituent, an assumption that is in some respects to be preferred to that of V. Susich. Although the relation between gutta percha and balata has been definitely established and there may be no ultimate difference between them, it is pointed out that the majority of specimens examined of material classified commercially as balata produce a diffraction pattern different from that of gutta percha, a fact of practical significance.

A Microturbidimeter for the Determination of the Rubber Content of Latex

S. D. Gehman and J. S. Ward

IT is desirable to devise a method for determining the dry rubber content of latex, which will be both more rapid than the two trial coagulation methods and more precise than the hydrometric method. The turbidity of latex, depending upon the volumetric number and size of the suspended rubber particles, offers a satisfactory criterion for the determination of the rubber content of latex. A microturbidimeter, herein described, has been adapted to such determinations. It permits more rapid determinations of the rubber content than the two trial coagulation methods. Its precision is less than the lengthy trial coagulation method, involving coagulation, creping and drying, but is probably greater than that of the shortened trial coagulation method involving only coagulation and creping. Its precision is approximately one per cent rubber in 35 per cent latex.

The turbidity of latex obeys the turbidity dilution law for rubber content values less than 15 per cent. The use of color filters, transmitting the shorter wave lengths of light, minimizes the effects of a difference in the effective mean particle size of different kinds of latex.

The Effect of Scrap Drying Temperature Upon Reclaimed Rubber Quality

Henry F. Palmer, George W. Miller, and John E. Brothers

DEVULCANIZED tube and whole tire scraps were subjected to temperatures of 260° F. and 275° F., respectively, and dried to a final moisture content of 2 per cent, preparatory to processing into finished reclaimed rubber. With increase in drying temperature, the acetone extract remains unchanged while chloroform extract increases. With the higher temperatures the reclaims show a progressive increase in softness and tackiness, the highest temperatures used appearing to be the practical top limit for ease of processing. Compounds containing approximately 35 per cent reclaim showed no detrimental normal or aged stress-strain characteristics. A maximum ultimate drying temperature of 250° F. to a minimum moisture content of 3 per cent is suggested for all standard types of devulcanized rubber scrap, with the recommendation that much lower ultimate drying temperatures be maintained and that more rapid drying be promoted by the use of higher temperatures in the wet end of the dryer.

NEW YORK *and* BOSTON *Rubber Groups Hold Enthusiastic Local Meetings*

NEW YORK MEETING

THE New York Group, of the Rubber Division, A. C. S., held its first dinner and meeting of the 1931 season, at Cavanagh's Restaurant, New York City, on the evening of March 11. The meeting was enthusiastically attended by 168 members and guests. Bob Albrecht's seven piece orchestra played throughout the dinner. The two technical papers, abstracted below, were presented following the dinner and short introductory speech of the chairman of the group, W. H. Whitcomb, of Henry L. Scott Co.

Incidental to the reading of his paper, Dr. Wiegand exhibited for the first time in America his pendulum form "rubber heat engine." This apparatus, operating through the Joule effect, transforms heat energy to mechanical energy sufficient to overcome the friction of the pendulum and the hysteris of the rubber and so keeps the pendulum in continuous oscillation. It had been exhibited previously by Dr. Porritt in Great Britain and Prof. L. Hock in Germany.

The Manufacture of Carpets by a New Process Involving the Use of Unspun Fibres Vulcanized to Fabric Backing

E. K. FILES AND M. R. BUFFINGTON, *Lea Fabrics, Inc.*

THE paper described the development of Lea carpet wherein the old operations incidental to the spinning of yarns are eliminated by the use of unspun fibres, each fibre being held vertically in a rubber base. Kid and goat hair are the animal fibres used in the process and give a wearing surface more durable than wool. Thorough cleaning and dyeing of the fibres are the first operations. The fabric backing used is also dyed and one side is coated with rubber cement by a rubber spreader of 140 in. width.

By means of an automatic weighing feeder a continuous predetermined weight of hair is delivered across the face of the carding equipment, which is 140 in. wide. The card delivers a thin web which is folded into a heavy bat. Slat apron conveyors carry the bats to the carpet-forming units. The carpet-forming unit consists of a massive cast iron drum 12 feet in diameter and 12 feet wide. The surface of this drum is clothed with a transverse laminated structure, containing 7 slots per inch, the elements of which are radical with respect to the axis. The laminated structure is built up of .025 steel strips separated by spacers .118 thick and forming a slot about 3/8" deep. Into this lamented or slotted structure the hair bat is inserted or folded by means of inserting blades to form a series of continuous loops. This looped structure is then given a coating of rubber cement. Sufficient rubber is applied to impregnate the base of the loop through to the top of the supporting steel strip. As the drum is steam heated the cement is dry after the drum has rotated through 90 degrees. At this point, the fabric backing, previously coated on one side with rubber is brought into contact with the rubberized hair structure.

The vulcanizing mechanism, supported on the main shaft of the drum, consists of a series of steam heated platens. The speed of vulcanizing is so adjusted that after passing through the platen assembly the rubber is properly cured and the carpet stripped from the surface of the drum after which the looped fibres are broken, steamed and sheared.

In the process either naphtha cement, latex or water dispersions may be used successfully. At the present time water dispersions are being used. Distribution is effected by the use of specially designed spray heads. The cement is used in a 60 per cent concentration.

One of the most difficult problems in the process was to secure a uniform distribution over the face of the drum and to be able to apply a predetermined quantity. The character of the finished carpet is effected more by non-uniformity of rubber than any other one factor.

Discussion

In the course of the discussion which followed, it was brought out that the rate of production in the above process as compared with the manufacture of woven carpets was 70 to 80 times greater. or about 200 square yards per hour for Lea carpets as against 18 to 20 square yards per day for woven carpets. In effect, this new method of making carpets is the first successful manufacture of synthetic textiles.

The cure obtained by the method outlined was stated to be excellent according to one member present, who had witnessed the process in operation. The method of shearing or trimming the fibre surface to the desired height by means of a specially designed garnetting machine was also said to be a novel solution as the usual methods used in woven carpet plants were found to be unsatisfactory.

As regards the colors in which these carpets may be obtained, at present only solid colors are used but stripes are possible. The carpets, due to their construction, lie flat on the floor and show no tendency to curl up. They may easily be cut to fit around obstacles, as on the floor of automobiles, with no tendency to unravel, thus doing away with the necessity of a binding edge, as on woven carpets used for such purposes.

It was found that water dispersions from tire and tube reclaim proved more satisfactory than crude rubber dispersions.

Effect of Overmilling on Natural Aging of Rubber

W. B. WIEGAND, *Binney and Smith Company*

EXPERIMENTS have been under way for some time in the laboratories of Binney and Smith Company with regard to the effect of mastication or milling upon the physical properties of carbon black mixings, particularly of the tread type. The paper presented was a brief excerpt from these studies relating especially to the effect of pronounced overmilling upon four years natural aging.

In brief, it was found that when tread type compounds were overmilled approximately 400% in the laboratory, first under conditions of normal mill opening, second with mills set up tightly together and with temperature artificially raised to approximately 300° on the one hand, and on the other cooled with water to approximately 60°, in all cases the green properties were markedly depressed and the result after four years' natural aging, whether measured by physical state, appearance and odor, or acetone extract, showed that the overmilled samples deteriorated much more seriously than did the samples which were normally milled.

It was explained that these results were communicated at this time because of the great amount of experimental work now being devoted in many countries to the improvement of the dispersion of carbon through various changes in the extent and kind of milling. The fact that greatly increased milling might injure the aging properties was therefore a fact which should be borne in mind in any such experimental program.

The meeting and dinner was preceded by a session of the executive committee and the date of the next meeting

has been tentatively set for May 20. The place for holding the meeting, however, has not been decided upon.

BOSTON MEETING

AN ENTHUSIASTIC meeting, attended by more than 170 members and guests, was held by the Boston Group of the Rubber Division, A. C. S., at the University Club, Boston, on the night of March 5. Over 50 members from outside of the Boston Area were present. An excellently served dinner preceded the meeting. After the reading and approval of the secretary's report three technical papers were delivered, as abstracted below.

Relation of Science to Industry

DR. KARL T. COMPTON, *President, Massachusetts Institute of Technology*

DR. COMPTON'S talk was along general lines and traced the inter-relationship between the various fields of science and industry. Every branch of engineering is simply an application of some principle of science to some need. He showed by examples how every feat of engineering depended on the results of long investigations by scientists, naming the radio, the difficulties in electrical transmission, discoveries of oil and gas and their useful application through scientific research, the discoveries in the field of illumination, and many other instances.

He stressed the economic effect of these developments on wages and unemployment and referred to the change in manufacturing during the period from 1899-1929. The population increased from 76,000,000 to 121,000,000, yet the population engaged in gainful toil remained very constant at 39 per cent.

The workmen profited by this practically to a constant extent of 40%. Has been no tendency for workmen to get less and less of profits of manufacturer. There has been no throwing of men out of work as a result of this great increase in manufacturing. Six per cent of the total population in 1899 were workers in factories and in 1929 the percentage was seven. The average wage has increased just a little over 300 per cent. These figures, of course, do not apply to any one industry. Where in 1899 it took 3 workmen to make a rubber shoe at the present time one workman can do the work and since wages have increased the one workman receives the same wage as were formerly paid to 3 men, but the other two men have found work in some other business which scientific developments have made possible. This proves science and engineering should not take a holiday but should keep on going. Should any particular group decide to slow up today on these developments it would really mean a going backward for them with its resulting ill effects.

What's New in Rubber Chemistry

HARRY L. FISHER, *United States Rubber Company*

THE paper presented a discussion of the most important scientific investigations in the chemistry of rubber published during the past year. The talk was illustrated with a number of lantern slides. Some of the most interesting results were the following:

The yellow coloring matter of pale crepe has been shown to consist of the hydrocarbon carotene, which is widely distributed in the vegetable kingdom. It is found in carrots, whence its name, and gives natural butter its yellow color. The heats of combustion of the purified hydrocarbons of rubber, gutta-percha and balata are identical and therefore the difference in their structure is most likely due to stereoisomerism or polymerization. Masticated rubber also gives the same heat of combustion.

Rubber has been crystallized and the crystallization can be repeated at will at —80°C. The fibrous nature of stretched rubber was illustrated by slides. Rubber will completely dissolve in solvents which ordinarily only swell it, if the time is extended to three to four years. The molecular weight of the unchanged rubber hydrocarbon as obtained from viscosity measurements is about 200,000. The rubber hydrocarbon is probably the *trans* form and the gutta-percha and balata hydrocarbon the *cis* form. Hydrorubber with a molecular weight of about 30,000 is somewhat elastic, whereas the lower molecular weight hydrorubbers are syrupy. High temperatures produce oily hydrorubbers which are being used in Germany as the best transformer oils obtainable.

Soft vulcanized rubber as well as hard rubber gives off hydrogen sulfide even at room temperature. Fossil rubber in German lignite coal was illustrated and mention was made that the fine hair-like strands in which it is formed are from plants belonging to the *Ficus* genus, which at the present time grows in Africa. A fascinating question has been raised, if sulfur vulcanization had not been discovered would the study of fossil rubber have led to its discovery. Fatty acids instead of solubilizing zinc oxide, litharge, etc., probably act chiefly in causing better dispersion of the oxides, thus giving a larger surface for action.

The experimental results of allowing slabs of rubber to vulcanize at room temperature were presented. The slabs were embedded in sulfur, and they dissolved sulfur in the cold. In 384 days the combined sulfur had risen to 2.93 per cent, in spite of the fact that the slabs had never been heated with any sulfur, even on the mill. The tensile was 4,160 pounds per square inch.

Progress in Rubber Manufacture

A. A. GLIDDEN, *Hood Rubber Company*

THE talk was in the nature of an interesting resumé of the progress in the rubber manufacturing business going back over 35 years. He pointed out the antiquated equipment used and drew interesting comparisons between costs in the earlier days and the present costs in a modern factory. Curiously enough, on the basis of the present prices of labor and crude rubber, the percentage costs for footwear manufacture 35 years ago were quite similar to those of today.

"Bullet-Proof" Tires

THE latest move in Britain's war against auto bandits is an experiment by Scotland Yard with a new type of tire claimed to be unskidable, unburstable, and unpuncturable. It has already undergone very extensive private trials and is to be fitted in the near future to one of the Flying Squad's light automobiles. Not even bullets from revolvers, rifles, or machine guns have any terrors for the invention, which for this reason is also claiming the attention of the military authorities of other European nations.

The merit of the invention lies in the inner tubes, which are subdivided into airtight compartments separated from each other by elastic partitions. Any bullet or spike penetrating the tire will only pierce one or possibly two of these cells, and as the partitions are elastic the air on either side of the damaged portions will expand to fill in the gap.

The non-skidable qualities of the tire are derived from a slightly corrugated effect which is communicated to the outer cover by the construction of the tube, making the cover resemble somewhat the shape of a caterpillar.

New Applications for Lexide

AUTOMOTIVE Super-Lexide, the new product of the Fibre Products Department of the United States Rubber Company, is finding new applications in the latest developments along the lines of automobile construction. It is a latex-cellulose material and is furnished in any degree of hardness and in any thickness from 1/32 to 3/4 inch. It can be die cut, stitched, punched or molded; can be grained like leather and coated any desired color. It is also waterproof and possesses exceptionally high tensile strength and can be folded back upon itself without cracking. Its application greatly lessens fire hazards.

Its principal uses in automobile construction are for upholstery foundation boards, door panels, cowl panels, anti-squeak body shims or spacers, hood lace, radiator and gasoline cap gaskets, etc. Its latest use is in the construction of omnibus panels.

Britain's Rubber Trade in 1930

THE United Kingdom, like the other principal exporting countries, showed a decreased trade in rubber products during 1930, amounting to 6 per cent as compared with the 1929 figures, according to preliminary statistics as published by the Department of Commerce. A slight value increase of less than 1 per cent was registered, and in imports the favorable balance of trade was reduced to a value of £3,381,500 from £3,927,868.

The universal, economic depression and lower prices of the crude material, forcing reduced prices for the finished product, are the two most direct causes for the British decline. The export trade of the Kingdom—in tires particularly—has not suffered from foreign competition as has that of other countries. United Kingdom tire manufacturers, in fact, are now giving greater opposition to their foreign competitors. In other products—footwear and specialties—the situation is reversed. British manufacturers have suffered from more intensified rivalry from such countries as Germany, Japan, Belgium, and a few other nations.

Value of United Kingdom Trade in Rubber Products[1]

Year	*Imports*	*Exports*	*Surplus of Exports*
1925	£6,627,942	£8,487,217	£1,859,275
1926	7,846,152	8,824,633	978,481
1927	4,063,033	7,865,992	3,802,959
1928	4,565,058	7,752,935	3,187,877
1929	4,620,857	8,548,725	3,927,868
1930[2]	4,624,600	8,006,100	3,381,500

[1]Does not include waterproofed clothing.
[2]Preliminary figures, subject to revision.

The continued decline in British imports of tires during the past few years and the advance in exports are signs of stability and strength within the national tire industry. During the past year imports of tires declined by 29 per cent in value as compared with 1929, while exports increased by 6 per cent. The United Kingdom is one of the few exporting countries to register a gain in tire trade—most nations have experienced a decided drop. The increase in British tire exports has been brought about by the augmentation of the industry, partly through United States capital, and the ability to supply the Continent on short notice.

Dunlop during 1930, undoubtedly, continued to supply the greatest portion of the domestic consumption, followed by British Goodrich and Avon. It seems to be the concensus of opinion that these three companies were followed in order by British Goodyear, British Firestone, British Michelin, India (British manufacture), Dominion (Canadian manufacture), British Pirelli, an American make, and Rapson.

The value of the British trade in tires for the past two years follows. The figures for 1930 are preliminary.

Value of British Trade in Automotive Rubber Goods

Item	*Imports* 1929	*Imports* 1930	*Exports* 1929	*Exports* 1930
Automobile casings	£309,957		£3,046,416	£3,421,746
Motor-cycle casings	28,873	£328,670	98,373	
Bicycle casings	101,474		380,092	415,372
Automobile inner tubes	24,191		403,011	
Motor-cycle inner tubes	4,251	63,457	21,088	544,100
Bicycle inner tubes	53,651		113,718	
Automobile solid tires	92,684		153,502	
Other solid tires	893	43,376	5,857	88,284
Total	£615,974	£435,503	£4,222,027	£4,469,502

Exports of rubber and balata belting declined from 31,779 hundredweight in 1929 to 27,444 hundredweight in 1930, or by 14 per cent. The principal outlets are the Union of South Africa, Sweden, and Norway—all of which have a domestic industry.

Although detailed figures are not available at present for hose and packing, the other principal items of the mechanical rubber goods group, it is believed that British trade experienced reverses in these items in 1930.

Although the tire trade manifested favorable tendencies the same was not true in regard to rubber footwear. Exports of the latter decreased from 343,786 dozen pairs in 1929 to 256,876 dozen pairs in 1930, or by 20 per cent. On the other hand, imports increased from 1,045,769 to 1,243,405 dozen pairs, or by 19 per cent. British rubber footwear exporters during 1930 experienced stiffer competition from other countries.

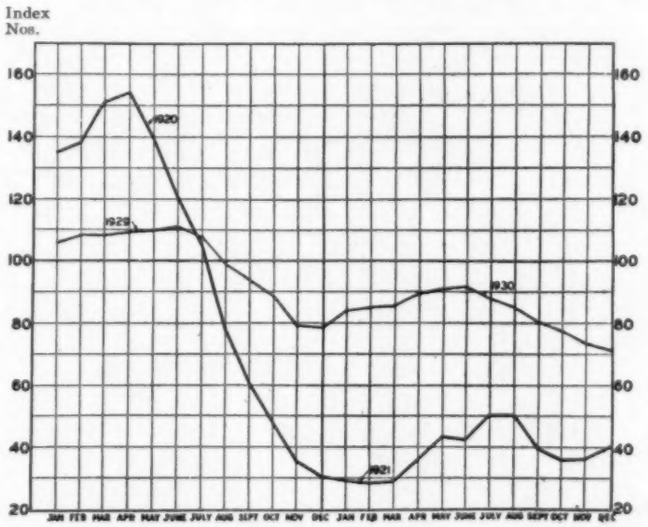
Stabilizing Employment at Goodyear

THE accompanying chart reproduced from the annual statement of the Goodyear Tire and Rubber Company, is a striking comparison of the fluctuations in the number of employes in the Goodyear plants in Akron, during the major business depressions of 1920-21 and 1929-30 respectively.

In this chart the 100 line represents monthly average employes during 1920 and 1929.

It will be noted that employment has been more stable in the present depression than in that of 1920-21, in spite of a substantial curtailment in production of finished products, during the last half of 1929 and through 1930.

This falling off in production activity was not as great,



however, in the present business depression, as in that of some ten years ago, due largely to the company's policy of control and co-ordination of future sales, production and inventories.

In the depression of 1920-21 the reduction in the number of employes and the curtailment of production were about the same in degree and extent, while in the present depression, the company has made every effort to keep as many on the pay roll as possible.

In this depression, the management has been more successful in stabilizing employment than at any other time, due primarily to: adopting a shorter working week; dividing the working force into four six-hour shifts, instead of three eight-hour shifts; and rotating the working force of some departments whereby a certain proportion of employes were off each day resulting in a working week of from 18 to 40 hours.

EDITORIAL COMMENT

A History of Restriction

A NEW book, of extreme interest as a contribution to the literature on the history of crude rubber, has made its appearance from the Princeton University Press, under the authorship of Charles R. Whittlesey, entitled, "Governmental Control of Crude Rubber." Essentially it is a historical review of the administration of the famous Stevenson restriction legislation in its attempt to regulate the supply of crude rubber, but it offers itself to considerable controversial criticism, in that the author has unconsciously acquitted restriction as a justifiable economic policy. In one place in the book he even implies that there is an analogy between the Stevenson scheme and our own principle of a protective tariff. Obviously the two policies are not analagous. One is based on a determination to maintain an established high standard of living for workers and a commensurate high wage scale, but it would be a long stretch of the imagination to attribute any such altruistic motives to the Stevenson plan.

There are a number of other unfortunate defects in this otherwise admirable volume. While the period under review is purposely limited to the six years of restriction administration, from 1922 to 1928, it is a pity that all the statistical tables stop at that point, when many interesting facts bearing on the ultimate results of the Stevenson scheme, could be readily deduced from these same tables had they been brought up to even the middle of 1930.

A number of the charts and tables seem to be pointless and without adequate explanation, for example, the chart on page 9, which attempt to show a relationship between native rubber produced in the D. E. I. and the market price, but only takes the curve up to the end of 1923. The table on page 153, covers the net profits of the leading American companies only up to 1926. The failure to expand this information to a reasonably later date, seriously detracts from the value of the volume.

Although it is trivial to mention, Mr. Whittlesey's historical data on the early development of the rubber industry is sometimes amiss. His statement that Goodyear "was unable to realize on his patents as he should have done and . . . died heavily in debt" is controverted by the fact that the United States Rubber Company has among its historical memorabilia of Charles Goodyear the statement of Goodyear's son, who was at one time Curator of Fine Arts at the Brooklyn Museum and a figure in the art world, that his father left an estate of a quarter of a million dollars and had paid off every debt before he died.

On the whole, however, Mr. Whittlesey's volume is a comprehensive study of a period in the industrial history of rubber which will long be remembered by those intimately associated with rubber trade circles.

Disciplined Industry

CONTRARY to the depressed conditions which prevailed in the American rubber manufacturing industry during the past year, it would appear from latest reports that the British tire manufacturers can look back upon 1930 as a very good year. The British companies in general registered a profit, maintained their prices, increased their output, expanded their plants and gained a larger share of the home market trade than ever before. The comparatively recent entry of three American companies into the British manufacturing field has called for certain readjustments among the established British films, but there have been no protests of unfair competition and the trade is reported, on the whole, to be optimistic in regard to the manufacturing situation.

"The fairly stable position of the tire manufacturing industry is partly due," reads a report from the office of the American commercial attache at London, "to the large outlay required for constructing a tire factory, thus precluding small manufacturers, and partly to *the disciplined conduct of the industry by men of generally high caliber. The size and importance of the leading makers prevent them from being stampeded into unwelcome changes.*" Through their excellently functioning body, the Tyre Manufacturers' Conference, attempts at undercutting in prices and discounts are more or less frowned upon and every effort is made to have the retailer observe the manufacturers' established price. (The italics are ours.)

What a contrast this latter picture presents when compared to the existing conditions surrounding the American tire trade. We have plenty of men of "generally high caliber" in the industry, but where is that "disciplined conduct in the industry" which prevents it from being "stampeded into unwelcome changes," cut-throat competition, price-slashing and all the other ills which it has suffered?

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

ANDERSON RUBBER WILL BUILD PLANT AT AKRON

Construction of its own factory building at Akron is announced by the Anderson Rubber Company, manufacturer of rubber toys, novelties and balloons, which now occupies rented space for its plant. A site of approximately 150 by 180 feet has been acquired at East Tallmadge avenue and Davis street, upon which a two-story building, 74 by 109 feet in size, is now being erected.

Contracts for the job have already been let to the Krumroy Construction Company, according to Selden W. Anderson, president of the company, and the building is to be completed June 1. The new structure will be one of the most modern and complete of the city's smaller factories and may mean employment of additional workers when it is opened.

The Anderson Company now occupies rented space in one of the units of the old Werner printing buildings on North Union street. The concern has been in operation there since 1907.

SIGHTSEEING DIRIGIBLE PLANNED FOR NEW YORK

New York City is to have daily sightseeing service by dirigible, beginning within the next few weeks, under plans just arranged by the Goodyear Tire & Rubber Company. Daily flights about New York City and surrounding towns will be operated from Holmes Grand Central Air Terminal on Jackson Heights as soon as a hangar is completed by the Austin Company. The Defender, ten-passenger dirigible of the Goodyear company, will be sent up from its winter base at Miami, Fla., as soon as the new airship dock is ready.

The ultimate purpose of the service is to familiarize prospective trans-oceanic passengers with lighter-than-air travel. "The real objective of the Goodyear company in aeronautics, through its subsidiary, the Goodyear-Zeppelin Corporation, is the establishment of passenger service, over the Atlantic and Pacific," states P. W. Litchfield, president, "using Zeppelin airships as large or larger than the one now being built at Akron for the United States Navy."

Negotiations are under way for a similar airship dock in Chicago. At the present time the company has its own docks at Akron, O., Gadsden, Ala., and Los Angeles, Cal., while municipal docks have been utilized at Miami and St. Petersburg, Fla.

Buys Hartford Rubber Unit

The Capitol File Company, Hartford, Conn., has purchased building No. 35 of the Hartford Rubber Works plant in the same city through Cross & Brown, New York real estate agents, who are handling the property for the United States Rubber Company, the sale price being $7,500. Several prospects are reported to be in sight for other buildings in the former tire and rubber plant.

Explosion at Seamless Plant

An explosion in the glove department of the Seamless Rubber Company, New Haven, Conn., on February 16 scattered blazing benzol and naphtha about the room and started a fire which did thousands of dollars damage to machinery, supplies and gloves ready for shipment. Although 75 persons were working in the room at the time, none was injured. The explosion was unofficially attributed to an electric spark from a motor near the benzol tanks. In 1921, the glove department of the Seamless Rubber Company was the scene of a $200,000 fire, in which several firemen were injured.

MUTUAL FACTORIES OFFER SPACE TO MANUFACTURERS

Under a unique plan, particularly adapted to the present day needs of many small rubber manufacturers, the Owners' Mutual Factories, Pottstown, Pa., is offering floor space in their modern rubber factory buildings to enable these companies to turn out their products without the burden of fixed plant charges and heavy overhead. Floor space is offered in areas of from 2,200 up to 22,000 square feet on one floor, and warehouse facilities for raw materials and finished goods are provided in an adjoining building.

Rubber milling and calendering facilities are furnished, if desired, with the work done either by the tenant or by the skilled operators of the Owners' Mutual Factories. Milling capacity up to 60,000 pounds daily is available. Steam is furnished for vulcanizing or other manufacturing purposes at a $4.75 base, and electric current is supplied at as low as six-tenths of one cent per kilowatt hour.

The factory buildings are of recent construction, of reinforced concrete-and-glass, daylight on four sides, 16- and 14-foot ceilings, sprinklers throughout, with about 22,000 square feet on each floor. The location in Pottstown, a town of 20,000, is on both the Pennsylvania and the Reading Railroads.

WILLIAMS-BOWMAN PLANT DOUBLES FLOOR SPACE

The Williams-Bowman Rubber Company, Cicero, Ill., manufacturer of plumbers' molded goods and other mechanical rubber items, has just completed a new addition to its factory which has more than doubled the floor space. The new structure consists of a one-story building 55 by 200 feet in size with a two-story section 55 by 50 feet in size for offices and showrooms.

The company is the oldest rubber firm in the Chicago district. Its business was first started in small quarters in Chicago itself in 1903, but in April, 1915, two acres of land was purchased in Cicero erected to meet the growing demand for the firm's products.

W. J. Williams, one of the founders of the company, is president and treasurer; R. M. Lindquest is vice-president; and H. V. McGurren is secretary.

FISK RUBBER WINS CASE AGAINST B. & M. RAILROAD

A report by C. A. Bernhard, examiner for the Interstate Commerce Commission, in the case of the Fisk Rubber Company against the Boston & Maine Railroad and the Baltimore & Ohio Railroad, has recently been returned in favor of the complainant. The examiner finds that the failure of the defendants to apply a so-called two-for-one rule to shipments of automobile tires and tubes, in carloads, from Chicopee Falls to transcontinental destinations, while applying such a rule to shipments from other points, was unduly prejudicial.

While recommending that the commission shall order the defendants to remove the undue prejudice, the examiner recommends that there was no unjust discrimination and that reparation should be denied. The complainant had alleged that the defendant companies had collected unlawful charges on six carloads of tires and tubes shipped between April 14 and June 5, 1928, from Chicopee Falls to Los Angeles, Cal., and Dallas, Tex.

Scrap Rubber Men Meet

Members of the Scrap Rubber Division of the National Association of Waste Material Dealers met at the Congress Hotel, Chicago, Ill., in connection with the 18th annual convention of the association on March 16, 17 and 18. An interesting program was presented, followed by important discussions of the problems of the industry.

HOUK RUBBER FACTORY ORDERED TO BE SOLD

Common Pleas Judge E. E. Lindsay on March 11 granted a default judgment of $65,166 to the Citizens National Bank, New Philadelphia, O., against the Houk Rubber Company, defunct Dover concern. Foreclosure of the factory formerly occupied by the Tuscora Rubber Company and 74 acres of land, located in Mooreville, O., between Dover and New Philadelphia, was ordered.

The suit was brought January 8 for $59,000 claimed due on a $79,000 loan made in March, 1927.

COLUMBIAN CARBON HAS 1930 PROFIT OF $2,514,923

The report of the Columbian Carbon Company and subsidiaries for the year ended December 31, 1930, shows a net profit of $2,514,923 after depreciation, depletion, federal taxes, minority interest, etc., equivalent to $5.04 a share on 498,505 no-par shares of capital stock. This compares with $3,665,491, or $7.83 a share on 467,929 shares, in 1929.

Due to the decline in the price of carbon black, the company's 1930 sales fell off to $9,756,328 from the high record of $12,659,484 set in 1929. After paying dividends to the amount of $2,936,166, the report shows a defficit of $421,243 as compared to a surplus of $1,378,771 in the year previous.

Goodyear Gadsden Plant Busy

The factory of the Goodyear Tire & Rubber Company at Gadsden, Ala., has stepped up its daily output this month from 5,500 tires to 6,500 tires. Three shifts of eight hours each are being operated, and 200 men were recently added to the working force. The capacity of the plant was only recently increased to a maximum of 7,000 tires daily.

Sears, Roebuck Sells Insurance

Sears, Roebuck & Company, Chicago mail order house and chain store organization, has incorporated the All-State Insurance Company for the purpose of selling automobile insurance by mail to its rural customers for All-State tires and other products. Thirteen Sears, Roebuck officers are listed as incorporators of the new company, which has a declared capital of $350,000.

Monsanto Earns $732,684

The financial report of the Monsanto Chemical Works and subsidiaries, including the Rubber Service Laboratories Company, for the year ended December 31, 1930, shows a net profit of $732,684 after depreciation, interest, federal taxes and other charges, equal to $1.73 a share on 422,600 no-par shares of stock outstanding. This compares with $1,691,338, or $4.25 a share on 398,286 shares, in 1929. Common stock outstanding was increased to 429,000 shares on January 2 due to payment of a 1½ per cent stock dividend.

AMARILLO GAS CONTRACT IS TAKEN BY J. M. HUBER

The City of Amarillo, Tex., has recently concluded contracts with J. M. Huber Petroleum Company to supply its requirements of natural gas. The Huber company has over 5,000 acres in the heart of the Borger oil field, with a large oil production and a total natural gas flow of over 500,000,000 cubic feet daily. It recently acquired a 50-mile pipe line from Borger to Amarillo for transporting gas.

The Huber company recently completed a new office building in Borger to house both the petroleum company and the carbon black offices.

RADIO LISTENERS KEEP GOODRICH TOY MEN BUSY

The rubber toy department of the Miller Rubber Company, subsidiary of the B. F. Goodrich Company, is working three shifts filling a huge order which came as a result of a recent broadcast on the Goodrich "Uncle Abe and David" program.

Goodrich officials promised a rubber likeness of "Uncle Abe" to all whose requests were postmarked within 30 hours after the announcement. The returns totaled 250,000, which is a record for a single announcement, according to National Broadcasting Company officials.

A special department was recruited to record the requests and mail the toys as the manufacturing department began to fill its largest single order for inflated toys in years.

Keys, Marks and Moffett Join Goodrich Executive Committee

THROUGH a revision of its executive committee, the B. F. Goodrich Company has brought three of its non-management directors into more direct association in the activities of the organization. These directors are Clement M. Keys, chairman of the board of the Curtiss-Wright Corporation; Arthur H. Marks, president of the Skinner Organ Company; and George M. Moffett, vice-president of the Corn Products Refining Company.

D. M. Goodrich, chairman of the board, and J. D. Tew, Goodrich president, will continue to hold their places on the executive committee. The new members will replace T. G. Graham, T. B. Tomkinson, V. I. Montenyohl and S. M. Jett.

The realignment of the executive committee is in line with a decision of the company to have the committee in the future consist of two management representatives and three non-management men. It is in line with a policy of bringing shareholders who are outstanding industrial leaders, whether in rubber or other lines, into closer relation with the conduct of the company's business. It is felt that the broad experience of Messrs. Marks, Moffett and Keys in varied lines of national business enterprise will prove of real help in decisions affecting the welfare of the rubber company.

Arthur H. Marks, after receiving his technical education at Harvard University, worked as assistant chemist for the Boston Woven Hose & Rubber Company and as chief chemist for the Revere Rubber Company before joining the Diamond Rubber Company as a chemist in 1899. His work in rubber technology is well known, particularly his development of the Marks alkali process for reclaiming rubber. He was vice-president of the Diamond company when it was merged with Goodrich in 1913, and he served as vice-president of the latter firm for a short time before retiring from the rubber business. He has since been active in stock market operations and in 1920 took over the failing Skinner Organ Company, putting it on a sound basis. He returned to Goodrich as a director in April, 1930.

Clement M. Keys became president of the Curtiss Aeroplane & Manufacturing Company some years ago and, upon its merger with the Wright Aeronautical Company, he became chairman of the Curtiss-Wright Corporation. He also heads C. M. Keys & Company, brokers, and is a director of the Skinner Organ Company and of other industrial organizations.

George M. Moffett is a director as well as vice-president of the Corn Products Refining Company, manufacturers of corn syrup, corn starch and other products. Like the other two new executive committee members, he is a resident of New York City.

General Tire Up 45 Points

General Tire & Rubber common created some sensation on March 7 by rising from 95 to 140 on an odd lot sale of 10 shares. President O'Neil denied that there had been any developments to warrant the sudden spurt and the stock subsequently declined, closing the period at 100 bid, 120 asked. New highs for 1931 were also made during the fortnight by U. S., Kelly-Springfield, Lee, Mohawk, Norwalk, and American Hard Rubber. The closing prices on March 19 compare as follows:

	Last Price		—1931—	
	Mar. 19	Mar. 4	High	Low
Aetna	4½	—	5	3¾
Ajax	—	—	½	¼
American Hard Rubber	35¼	—	35¼	30
Dayton "A"	—	—	—	—
Falls	—	—	—	—
Faultless	—	—	37	35
Firestone	17¼	—	19¾	17
do. 6% pfd.	62	60½	63	56½
Fisk	⅝	⅞	⅞	½
do. 1st pfd.	2½	2½	3	2
General	—	95	140	81
do. pfd.	—	—	87½	83
Goodrich	19¼	17⅝	20⅞	15¼
do. pfd.	—	64	68	60
Goodyear	49½	47¼	52¾	38⅝
do. 1st pfd.	88½	—	91	81
India	13	—	13½	8⅝
Intercontinental	4¼	4	4½	2
Kelly-Springfield	3⅛	2⅛	3⅛	1⅝
do. 6% pfd.	39½	—	39½	35
Lee	4¼	4	4¼	3⅛
Mohawk	8	—	8	3
do. pfd.	—	—	35	35
Norwalk	1	—	1½	½
Pirelli	—	—	38⅞	31⅞
Raybestos-Manhattan	27½	24	29¼	18⅝
Seiberling	6½	6¼	7½	4¾
do. pfd.	—	35	40	33
U. S. Rubber	19⅞	15⅝	19⅞	11¾
do. pfd.	34	28¼	34⅝	20¾

Names in the News

MARSHALL L. HAVEY, general sales manager of the New Jersey Zinc Company, and M. M. WATKINS, assistant sales manager of the Brown Instrument Company, were members of the committee in charge of the meeting of the Industrial Marketing Executives of New York at the Pennsylvania Hotel, New York City, on March 17.

R. T. GRIFFITHS, general sales manager of the Miller Rubber Company, was the speaker at a management dinner of the B. F. Goodrich Company at Akron on March 5. He described the rise of the Miller organization from a manufacturer of fountain pen sacks to one of the major rubber sundries companies of the world, stating that Miller was in reality an offspring of Goodrich as all its early employes were recruited from Akron's first rubber company.

JOSEPH JOHNSTONE has retired from the board of directors of the India Tyre & Rubber Company (Great Britain), Ltd.

N. V. CLARKE and D. G. C. WAKEHAM have been appointed by the Goodyear Tyre & Rubber Company (Great Britain), Ltd., as special representatives of the commercial tire department. F. P. MORLAND and F. A. OATES have been appointed as general line salesmen in the southern division, C. F. NICOL, E. BIRD and E. ADDIS in the western division, and F. ROODHOUSE, S. BERRY and A. ALLAN in the northern division.

CHARLES E. GUEST, vice-president and general manager of the United States Rubber Export Company, has returned from a trip around the world in the interests of his company. During the course of his trip he paid business visits to "U. S." distributors throughout Europe, Asia and Africa.

F. B. DAVIS, JR., president of the United States Rubber Company, was the guest of honor at the first annual banquet of the United States Rubber Club, at Detroit, on the evening of March 11, held at the Hotel Fort Shelby.

WILLIAM O'NEIL, president of the General Tire & Rubber Company, arrived at Miami, Fla., on March 14 with Mrs. O'Neil. They will spend two or three weeks in the southern city until Mr. O'Neil is completely recovered from the effects of breaking his ankle last December and straining his leg and shoulder in January.

H. J. ZIMMERMAN, traffic manager of the B. F. Goodrich Company, and H. J. Carroll, traffic manager of the Goodyear Tire & Rubber Company, are to attend the conference of the regional advisory board of the Great Lakes area in Cleveland, O., on March 25.

ERNEST T. HANDLEY, formerly with the Republic Steel Company, Youngstown, O., has just sailed from New York to take charge of the new plant of the Firestone Tire & Rubber Company, now nearing completion at Llavallol, Argentina.

JOHN H. KELLY JOINS THERMOID ORGANIZATION

The Thermoid Rubber Company, Trenton, N. J., manufacturers of mechanical rubber goods, announce that John H. Kelly has joined their staff.

Mr. Kelly has a long record of successful experience in the rubber business behind him. He started with the B. F. Goodrich Company in 1898 and from there went to the Republic Rubber Company, where he rose to vice-president in charge of sales by 1912. Later Mr. Kelly became president of the Hewitt Rubber Company and when this organization entered the Gutta Percha Rubber Mfg. Company-Robins Conveying Belt Company merger, he assumed the vice-presidency in charge of sales.

Since 1928, when Mr. Kelly was forced to retire from active duty due to a serious illness, he has been doing special counselling work. Mr. Kelly's wide acquaintanceship throughout the country among distributors, railroads and large industrial users of rubber products will be particularly valuable to Thermoid in the expansion planned for their mechanical rubber goods division.

VICTOR M. CUTTER, president of the United Fruit Company and a director of the United States Rubber Company, will address the 18th National Foreign Trade Convention at New York City, which opens May 27, on "Our Relations With Latin America."

JOHN A. MACMILLAN, president of the Dayton Rubber Manufacturing Company, left Dayton, O., on March 7 for a southern trip which will take him as far as Havana, Cuba. He will remain on the island until the end of March.

GEORGE F. WILSON, former development engineer for the B. F. Goodrich Company, is now recuperating from a long illness at the Springfield Lake Sanatorium.

JOHN S. SLEEPER, advertising manager of the Firestone Tire & Rubber Company in 1912 and 1913, disappeared after a visit to Cincinnati on January 2. A nation-wide search has thus far failed to reveal any trace of his whereabouts.

A. R. HEATH, London representative of the Barr Rubber Products Company, Sandusky, O., has returned to England after a short visit to the company's factory. He declared that sales of the company's products abroad were very satisfactory.

J. A. HOBAN has been appointed merchandising manager of Goodrich Silvertown, Inc., retail division of the B. F. Goodrich Company, and JAMES S. PEDLER has been named as head of the division's aeronautic sales. Mr. Hoban was formerly manager of the Chicago zone for Goodrich, while Mr. Pedler was Goodrich airplane tire and accessory manufacturers' salesman in Akron and New York.

GENERAL WILLIAM E. MITCHELL, former chief of the Army Air Service, was the guest of P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, at Akron on March 2. He inspected the airship dock of the Goodyear-Zeppelin Corporation.

CLARENCE CHAMBERLAIN, trans-Atlantic flyer, conferred with officials of the B. F. Goodrich Company in Akron on March 3. Mr. Chamberlain, who is president of the Chamberlain Aircraft Company, inspected the Goodrich wind tunnel and the new ice-breaking device for airplane wings.

MILLARD J. HAMLIN has retired at the age of 69 as a foreman of the American Hard Rubber Company at Akron, O., after 43 years of service. He entered the organization in 1888 when it was known as the Goodrich Hard Rubber Company.

GRAND DUCHESS MARIE, cousin of the late Czar Nicholas II, was given a trip in the Puritan, small dirigible of the Goodyear Tire & Rubber Company, in the course of her visit to Akron early this month to address the Women's City Club. HARRY BLYTHE, assistant to P. W. LITCHFIELD, president of Goodyear, accompanied her and explained the features of lighter-than-air navigation.

CHARLES R. FLINT, at one time nationally prominent as "The Father of Trust," has retired from all business activities at the age of 81. One of his greatest consolidations was the United States Rubber Company, and among his other triumphs were the American Woolen Company, American Chicle Company, International Business Machine Company and the American Hawaiian Steamship Company.

W. C. YOUNG, aeronautics department manager of the Goodyear Tire & Rubber Company, spoke on February 25 before the members of the Craftsmen's Council at the Burns Club, Akron, O. He declared that lower passenger fares on air routes have stimulated business, and he asserted that there is no conflict between lighter-than-air and heavier-than-air transportation.

EARL D. PAGE, former control manager of the mechanical goods department of the United States Rubber Company, has been named controller of the Philadelphia & Reading Coal & Iron Company.

Rubber News Around the World

GOODYEAR OF ENGLAND EXPANDS ITS FACTORY

The Goodyear Tyre & Rubber Company (Great Britain), Ltd., last month completed the construction of a new wing at its factory at Wolverhampton, England. In celebration of the event, a motion picture show, card party and dance was held for 1,400 employes of the company and their families.

The British Goodyear factory on February 24 turned out its 2,000,000th tire. The plant turned out its first casing in December, 1927, and has been in production at a uniformly high rate since that time.

NIPPON FOOTWEAR FIRM IS NOW MAKING TIRES

The Nippon Tabi Kabushiki Kaisha, in Kyushu, Japan, has commenced the manufacture of automobile tires. This is a company of purely Japanese ownership and management, having a paid-up capital of approximately $2,500,000, and 15 years' experience in the manufacture of rubber goods.

Rubber footwear is the chief product of this corporation, which now has a daily output of 70,000 pairs of rubber-soled tabi (laborers' canvas shoes with separate space for great toe) and 25,000 pairs of canvas rubber-soled shoes in foreign styles.

Carbon Black Exports Lower

Exports of carbon black from the United States last year amounted to 84,260,447 pounds, with a value of $5,789,458. Exports during 1929 totaled 91,829,215 pounds, worth $8,270,837.

Englebert Output at Peak

The position of Englebert Fils & Compagnie, of Liege, Belgium, continues to improve and the factory is operating at its maximum capacity of approximately 4,000 units a day. The company enjoys practically a monopoly of all the original equipment of American cars assembled in Belgium and also is estimated to control about 36 per cent of the trade on the open market in that country.

A Correction

In the February 10, 1931, issue of THE RUBBER AGE, the statement was made in connection with the description of the new rubber laboratory of the Graesser-Monsanto Chemical Works, Ltd., that this was the first rubber service laboratory to be established in England. We have since been informed that the British Dyestuffs Corporation, Ltd., Manchester, have operated a complete private testing and service laboratory in connection with rubber chemicals for the past six years.

London I. R. I. Meeting

The London and District Section of the I. R. I. plans to assemble at the Arts Theatre Club in that city on April 6. H. C. Young will present a paper on "Vibration of Buildings and the Possibility of Rubber as a Useful Shock Absorber."

New Rubber Roadway Process

Parry Evans, a Malacca chemist, is reported as having developed a hitherto unknown process of curing raw latex, which may result in easier and cheaper laying of rubber roadways. Two methods are available, either preparation in slabs or the mixing of the latex in matrices at the roadside.

Fire Destroys Crude Rubber

A fire at Butlers Wharf, London, destroyed 1,154 tons of rubber and resulted in London stocks as of March 14 showing a decline of 450 tons from the previous week. Despite this loss, a gain of 1,618 tons in Liverpool stocks caused total English warehouse inventories to rise to a new peak of 130,106 tons.

U. S. Leads Belting Exports

The United States maintained its lead as the principal exporter of rubber and balata belting during the year of 1930, according to estimates by the Department of Commerce. During the past year, the United States exported approximately 4,382,000 pounds of such belting as compared to export of 2,932,000 pounds by the United Kingdom and 1,375,000 pounds by Canada. In 1929, the United States exports amounted to 5,739,000 pounds, those of the United Kingdom to 3,559,000 pounds, and those of Canada to 1,472,000 pounds.

TO AWARD COLWYN MEDAL TO EXAMINATION WINNER

The Council of the Institution of the Rubber Industry has decided that in future the Colwyn Gold Medal shall be awarded each year to the candidate submitting the best set of answers in an examination for any branch of the associateship, provided that the total number of candidates taking the various associateship examinations in that year is at least 12. The first associateship examination for 1931 will be held June 1, and the second in November.

The first Colwyn Gold Medal was awarded in 1928 to Professor G. Stafford Whitby for distinguished services to the rubber industry, and the second medal was awarded in 1929 to W. H. Stevens for the best essay by candidates under 25 years of age. The medal in the 1930 essay competition, open to candidates of all ages, was not awarded as the essays received did not come up to the desired standard.

WILKINSON PROCESS CO. SHOWED LOSS DURING 1930

The Wilkinson Process Rubber Company, Ltd., has reported for the year ended September 30, 1930, a gross profit of $48,249, but after allowing for depreciation, selling expenses, general administration and other charges a net loss of $78,650. To this has been added the loss of $271,032 brought forward from the previous year, bringing the balance to the debit of profit and loss account at September 30 up to $349,683.

During the past year a private company was formed under the name of Wilkinson Rubber Linatex, Ltd., with headquarters at London, to carry on the business of manufacturers of and dealers in Linatex, rubber flooring and rubber goods of all kinds, with the sole right to buy the parent company's products and resell them in Europe and the British Isles. A company with similar exclusive selling rights for the United States was incorporated under the laws of Illinois with headquarters at Chicago.

The board of directors of the parent company now consists of J. Hands, C. C. Dunman, B. Wilkinson and the Hon. H. B. Egmont Hake.

REDFERN'S RUBBER WORKS SHOW INCREASED PROFITS

The financial statement of Redfern's Rubber Works, Ltd., for the year ended December 31, 1930, shows a net profit of £30,247, or approximately $147,000. This compares with a 1929 showing of £22,366, or about $108,000.

Dividends distributed on the ordinary shares were raised to 10 per cent, as against 7½ per cent in 1929 and 5 per cent in 1928. The company had at the end of last year repaid all outstanding loans.

Dominion Rubber is Busy

The Dominion Rubber Company, Ltd., is busy supplying Atlas tires to be sold through the service stations owned or controlled by Imperial Oil, Ltd., throughout Canada. Other departments are also busy, and favorable progress is being made on the one-story addition to the Papineau branch factory. Changes in the equipment of the footwear and mechanical rubber goods plant are mainly responsible for this extension.

Canadian Rubber Imports

Canadian imports of crude rubber during the year of 1930 amounted to 28,793 long tons, valued at $8,681,743, an average of 13.46 cents a pound. Imports in 1929 totaled 35,453 long tons, valued at $17,108,554, or 21.54 cents a pound. The 1930 figures were 19.8 per cent less than those for 1929 in quantity and 49.3 per cent less in value.

Rubber Goods and Specialties

All Rubber Waders

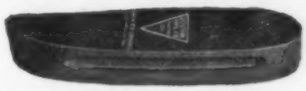
For those trappers and fishermen who have long wanted light-weight waders with a strong, snag-resisting rubber surface, the Converse Rubber Company, Malden, Mass., has introduced its new type Converse-Hodgman all rubber waders. Their construction is of durable olive jeans fabric, friction

coated with olive colored rubber. The outside is of rubber and the inside of fabric, except for chafing inseam reinforcements where fabric is outside to insure long wear. Built-in cleated soles eliminate dangerous slipping, the foot-shaped last provides comfort, there is a handy inside pocket, and the waders are supplied with suspender buttons and draw string. The weight of the waders is only five pounds, six ounces.

Oak Zig Zag Balloon

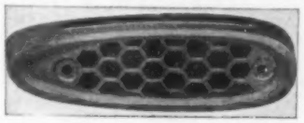
The Oak Rubber Company, Ravenna, O., has announced as its newest decorated item the Zig Zag balloon. Printed with eight zig

zag stripes in two different colors, this balloon is a striking number and is already meeting with a popular reception from the trade.



New Jostam Recoil Pad

The Jostam Manufacturing Company, Chicago, Ill., is introducing for 1931 the "No Kick Coming" recoil pad of red molded rubber construction with imbedded metal base, which eliminates all breakage and is easily



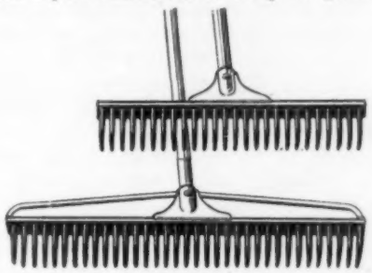
attached. There is no hard rubber base to this pad, and the two screws which hold the pad to the gunstock are screwed home to this metal base and the screw heads shoulder against this metal base.

Rubber Instruction Models

The use of rubber for instruction models is spreading to widely diversified fields. British students of domestic science at the North Western Polytechnic use a rubber model of a baby in learning the proper method of giving a bath to a child. Boys in training for farm work in Canada are given their first instructions in milking with the aid of a rubber cow, the body of which may be filled with water for demonstration purposes.

Sabin Gumfinger Lawn Rake

Made with rubber prongs, the Sabin Gumfinger lawn rake can not tear or uproot grass, can not rust, break or clog, and can be used on gravel, brick, dirt or concrete walks without fear of wear. Left accidentally on the ground with teeth upright, it can be stepped on without kicking back. Children can fall on it without danger. The flexible teeth adjust themselves to every irregularity



in the ground surface and sweep clean. They have a springy action that helps to kick the leaves into the pile at every stroke. This rake is made in 16-inch, 20-inch and 24-inch widths by the Sabin Machine Company, 6536 Carnegie Avenue, Cleveland, O.

Rubber Radio Pillow for Hospital Use

A RADIO pillow for use in hospitals and Pullman cars has just been developed by the Engineering Products Division of the RCA Victor Company, Inc. The radio pillow is of regulation hospital size, and is made of special sponge rubber in which a sensitive radio reproducing unit is concealed. It is so constructed that although the sound permeates the pillow it can not be heard except by resting the head on the pillow. The RCA radio pillow was designed especially for use in hospitals to replace ordinary earphones which become irksome and chafe when worn for any length of time. The loudspeaker is impracticable, because the radio programs may disturb other patients.

The new pillow, according to its sponsors, may be sterilized like an ordinary pillow, and the pillow-cases changed at will. The patient lies in a natural reclining or sitting up position to hear the radio programs. A connecting cord of ample length is plugged into the centralized radio receiving system.

Crude Rubber Items

J. G. STOLLER PREDICTS A SHORTAGE OF RUBBER

That the present overproduction of crude rubber and consequent low prices will ultimately mean much higher costs and an actual shortage of the commodity within a few years, is the opinion of J. G. Stoller, secretary of the General Tire & Rubber Company. Basing his statement on Lieutenant Colonel J. C. G. Kuhnhardt's study, "The Future of Rubber," Mr. Stoller foresees that the current low quotations will react against the consumers.

"The present price of rubber is harmful in other ways," he finds. "It causes many estates to be neglected and trees may thus be attacked by disease, retarded by lalang and jungle growth or destroyed by fire. It produces a false sense of security among manufacturers and other buyers.

"Above all, it is causing valuable bark to be consumed to no purpose when it should now be preserved with the utmost care. Evidence points strongly to the fact that this bark will become far more valuable to the producer and incidentally to all manufacturers and other consumers of rubber within the next few years."

SOUTHERN STATE PORTS RECEIVE CRUDE RUBBER

Compilation by the Department of Commerce of United States imports of crude rubber by customs districts during 1930 reveals significant changes. South Atlantic and Gulf ports (Virginia, Georgia, Mobile and New Orleans) cleared 11,860,208 pounds of crude rubber last year, or 1.09 per cent of the total United States imports, reflecting recent developments in rubber manufacturing in the southern states. In 1929, these ports received no crude rubber shipments.

Despite the general decline in imports, the entries of crude rubber via Pacific ports showed an increase in tonnage last year and accounted for 6.55 per cent of the total United States imports, compared with 5.53 per cent in 1929. The customs districts of Massachusetts and New York maintained their places of importance as ports for the entry of rubber imports, standing higher in percentage of total imports although losing in actual tonnage. New York received 85.76 per cent of the nation's total imports and Massachusetts 3.59 per cent.

Against these increases may be compared the figures for Ohio of 43,947,408 pounds, or 3.48 per cent of the total, in 1929 and 14,895,200 pounds, or 1.37 per cent of the total, in 1930. Maryland's drop from 20,747,562 pounds in 1929 to 7,583,621 pounds in 1930 was also abrupt, and Philadelphia showed a sharp decline.

NEW BALING METHOD MAY GIVE RUBBERSEEDS VALUE

New compressing and baling methods devised by the Oilseeds Baling Company, Ltd., may make rubberseeds more valuable, according to A. W. MacIlwaine, chairman of that organization. Instead of bulky bags with high freight charges, shipments in compressed bales are recommended and have been found not only more economical but also better for preserving quality.

The process has already been demonstrated on a commercial scale, about 1,400 tons of various products, including 600 tons of rubberseed kernels, having been baled and shipped to England in excellent condition. Some 500,000 tons of rubberseeds, now going to waste each year, will yield about 200,000 tons of kernels when decorticated and baled. Rubberseed kernels contain about 45 per cent of valuable oil, while the residual meal is a nutritious cattle food.

The Rubber Exchange will be closed on Friday, April 3, and Saturday, April 4.

Closing Prices on Rubber Exchange of New York, Inc.

FROM MARCH 4 TO MARCH 17, 1931

		Spot	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Sales
No. 1 Standard Contract of 10 Tons															
Mar.	4	8.30	8.30	8.40	8.50	8.59	8.68	8.79	8.90	9.00	9.10	9.20	9.30	9.40	85
	5	8.18	8.07	8.17	8.27	8.37	8.47	8.56	8.66	8.75	8.85	8.95	9.05	9.15	51
	6	8.06	8.00	8.08	8.17	8.25	8.33	8.44	8.54	8.64	8.74	8.84	8.94	9.04	71
	7	8.05	8.02	8.11	8.20	8.28	8.37	8.47	8.57	8.66	8.76	8.85	8.95	9.05	20
	9	7.82	7.74	7.82	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.65	8.78	43
	10	7.92	7.85	7.97	8.10	8.18	8.25	8.38	8.50	8.60	8.68	8.75	8.83	8.90	46
	11	7.82	7.75	7.87	7.99	8.07	8.15	8.25	8.36	8.44	8.52	8.61	8.71	8.81	28
	12	7.92	7.90	8.00	8.10	8.18	8.25	8.36	8.48	8.56	8.65	8.75	8.85	8.95	29
	13	7.82	7.75	7.84	7.93	8.03	8.13	8.21	8.30	8.41	8.52	8.65	8.75	8.85	85
	14	7.70	7.60	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.48	8.58	8.68	74
	16	7.72	7.65	7.70	7.76	7.83	7.90	8.00	8.12	8.23	8.33	8.44	8.54	8.64	26
	17	7.92	7.85	7.92	8.00	8.08	8.15	8.22	8.30	8.42	8.53	8.65	8.75	8.85	16
Old "A" Contract of 2½ Tons															
Mar.	4	——	8.20	8.30	8.50	8.60	8.70	8.80	8.80	8.90	9.00	9.10	9.25*	9.35*	50
	5	——	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.02*	9.12*	18
	6	——	7.90	7.90	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.92*	9.02*	35
	7	——	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.92*	9.02*	12
	9	——	7.70	7.70	7.80	7.90	8.00	8.10	8.30	8.40	8.40	8.50	8.62*	8.72*	56
	10	——	7.80	7.90	8.10	8.20	8.20	8.30	8.40	8.50	8.60	8.70	8.80*	8.85*	14
	11	——	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70*	8.80*	91
	12	——	7.70	7.90	8.10	8.20	8.20	8.30	8.40	8.50	8.60	8.70	8.83*	8.93*	38
	13	——	7.60	7.70	7.90	8.10	8.10	8.20	8.30	8.40	8.50	8.60	8.73*	8.83*	94
	14	——	7.60	7.60	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.30	8.53*	8.63*	52
	16	——	7.60	7.60	7.70	7.70	7.80	7.90	8.00	8.20	8.30	8.40	8.53*	8.63*	76
	17	——	7.80	7.80	7.90	8.00	8.10	8.10	8.20	8.40	8.40	8.50	8.63*	8.73*	10

*New "A" Contract

LEATHER FLOORING AND SHOCK ABSORBERS URGED

Leather for flooring, automobile shock absorbers and waterproof footwear, uses to which rubber is now put, was urged by Dr. John Arthur Wilson, consulting tanner and chemist of Milwaukee, in a talk on March 13 after receiving the Nichols Medal of the New York Section of the American Chemical Society. The award was presented to Dr. Wilson for outstanding achievement in colloid chemistry, applied particularly to leather and sanitation.

As a floor covering, specially prepared leather would be cut into squares a quarter of an inch thick and cemented to the floor base. It will produce a tiled glass parquet effect, may be glossed and colored, and will have added resiliency. Its use, he said, could utilize the 1,000,000 surplus hides now in storage.

Other new uses will have to be found for leather, Dr. Wilson said, if the industry is to recover. Another possible use for leather is as a shock absorber on automobiles and railway cars, where it will prove superior to rubber, he said. Dr. Wilson also described a particular shoe leather which sheds water on the outside but allows perspiration to escape from the inside 80 per cent as quickly as from the bare foot.

COMMISSION UPHOLDS CLAY FREIGHT RATES

In a decision of interest to the rubber industry, the Interstate Commerce Commission on March 10 held that rates on carload shipments of finely ground clay from Barberton, O., to points in Pennsylvania and New England states were applicable and reasonable, and dismissed the case instituted by the Aluminum Flake Company of Barberton.

Complaint against the existing rates of 80 per cent of sixth class was filed by the Aluminum Flake Company; the Hamilton, Acme, Manhattan and the Luzerne Rubber companies on the grounds that "Aluminum Flake Clay," used in the manufacture of rubber, should be classified for shipment as ordinary clay.

Before dismissing the complaint, the commission pointed out that clay for rubber manufacture was approximately six times as valuable as ordinary fine clay, holding that rates of 17 cents per 100 pounds on shipments from Barberton to Buffalo, 32.5 cents to New England states and 30.5 cents to New York and New Jersey points were reasonable.

The commission refused to allow the reparation sought and prescribed the same rates for the future.

Cotton Goods Specification

A recommended commercial standard for cotton goods for rubber and pyroxylin coating was sent out to producers, distributors and users under date of February 20. It comprises a specification for this material adopted by the Cotton Textile Institute and a number of co-operating organizations and endorsed by the Rubber Manufacturers Association. Copies may be obtained from the Bureau of Standards, Washington, D. C.

FIND BALLOON CASINGS END RIDGING OF ROADS

Gravel roads that become corrugated and termed "washboard" highways have been found to be the results of high pressure tires and high speeds. Tests of the engineering experiment station at Washington State College indicate that balloon tires and shock absorbers on automobiles prevented formation of the ridges.

It was found that a car with high pressure tires and no shock absorbers produced the "washboard" effect in 36 trips over a dry gravel road at 40 miles an hour and in 100 trips at 25 miles an hour.

Maurice J. Kirby

Maurice J. Kirby, sales engineer of the Fisk Rubber Company, Chicopee Falls, Mass., died at the Mercy Hospital in Springfield, Mass., on March 3 after a short illness. Mr. Kirby was a native of Springfield.

He entered the employ of the Fisk Rubber Company 25 years ago in the production department and later worked in the sales department, and became branch and service manager. Five years ago he received his appointment as sales engineer and held that position until the time of his death. Mr. Kirby was recognized as one of the industry's most efficient and practical engineers.

He was one of the most popular men in the Fisk organization and was known in the rubber business throughout the United States. Besides enjoying the warm friendship of many of the men in the rubber industry, he had a host of friends in his home city. He was a member of the Springfield Lodge of Elks, Home City Council K. of C. and a member of the Ludlow Country Club. He is survived by his wife, his father, six brothers and five sisters.

The funeral services, which were conducted on March 6, were attended by executives and employes of the Fisk company, members of the various fraternal organizations and friends and relatives of the deceased. Burial was in St. Benedict's Cemetery. Honorary pall bearers included officials of the Fisk company.

Allen W. Clark

Allen W. Clark, founder and president of the American Paint Journal Company, died March 7 in a hospital at St. Louis, Mo., at 63 years of age. Educated at Franklin College, Mr. Clark was active in newspaper work until 1901 when he came to St. Louis, where he established the *American Painter and Decorator* and the *American Paint Journal*. He was a member of the Chemists and Drug and Chemical Clubs of New York and other organizations.

Scrap Dealer Moves

The Loewenthal Company, dealers in scrap rubber, announces the removal of its offices to the Steuben Building, 188 West Randolph street, Chicago, Ill. The firm was formerly located at 947 West Cullerton street in the same city.

Watson-Stillman Buys Burroughs

The Watson-Stillman Company, Roselle, N. J., has purchased the assets and business of the Burroughs Company, Newark, N. J., for many years specialists in designing and building plastic molding hydraulic machinery, including tilting head presses, rodless hubbing presses and celluloid working machinery. The Watson-Stillman Company will continue this line, adding to it its own extensive line of similar equipment.

Givaudan-Delawanna, Inc., New York City, is now offering a new product under the name of Tex-O-Dors to the textile and finishing trades for deodorizing unpleasant odors in finished goods. At present three types, each with a different odor, are available.

CLASSIFIED ADVERTISING

Five cents a word, minimum charge $2.00, payable in advance.
Address replies to Box Numbers
THE RUBBER AGE
250 West 57th St., New York City

SITUATIONS WANTED

MECHANICAL GOODS

Technical and practical executive with 15 years' experience in large, medium and small companies has held the following positions: Chemist, compounder, development engineer, sales engineer, sales manager, purchasing agent, technical engineer and manager, foreman, superintendent, factory manager, general manager and president.

Desires to become associated with a company where this broad detailed knowledge supported by originality and initiative can be used to advantage.

Preferably the remuneration to be on the basis of small salary and profit sharing arrangement. Address Box 581, THE RUBBER AGE.

SITUATIONS WANTED (Cont.)

FACTORY EXECUTIVE

Who is a high grade chemical engineer and former superintendent of several of the largest plants in the Rubber Industry, will soon be available and desires a permanent connection with a well-financed company. Also for several years have been identified with a competent and complete Sales Organization, capable of turning over any products at a profit, of any plant I would identify myself with.

Salary is not important, preferring to participate in the future profits resulting from my efforts and a permanent connection.

Will consider correspondence with well-financed companies only. Address Box 580, THE RUBBER AGE.

RUBBER CHEMIST, capable of taking control of manufacturing, processing, development and research in brake lining plant manufacturing lining for both industrial and automotive purposes. Address Box 582, THE RUBBER AGE.

Let me take care of your
CHEMICAL WORK
and
MANUFACTURING PROBLEMS
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LIBERAL WORKING SAMPLE FURNISHED FREE

LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, MARCH 18, 1931

RUBBER

Crude

PRICE quotations for crude rubber varied but slightly during the fortnight and closed on March 18 at practically the same levels as on March 3. World stocks of the commodity on February 28 were undoubtedly at the highest level for any month-end in history, and this fact held the market back from advancing on news of the progress being made toward a new plan of restriction.

The Dutch rubber committee, which conferred earlier in the month with representatives of the British industry, was scheduled to leave Amsterdam for London on March 20 to resume negotiations. French and Belgian producers are also expected to participate, and the sentiment appears to be that prospects for an understanding were never more favorable. The Netherlands Colonial Minister is believed to favor an agreement, and Lord Passfield, British Colonial Secretary, has indicated that he will give careful consideration to any plan to relieve the depressed state of the plantation industry.

The negotiations are being focused on the plan of Sir George Maxwell, based on a pivotal price of 9d for rubber with a 25 per cent restriction of exports and a 10 per cent duty on native Dutch East Indies rubber.

Prices quoted on the New York outside market at the close on March 18 follow:

Plantations—

Ribbed Smoked Sheets—			
Spot-Mar.	.07⅞	@	.08
Apr.-June	.08	@	.08⅛
July-Sept.	.08¼	@	.08⅜
First Latex, crepe spot	.08	@	.08⅛
Amber Crepe, No. 2	.07½	@	.07¾
Amber Crepe, No. 3	.07½	@	.07⅝
Amber Crepe, No. 4	.07⅛	@	.07⅜
Brown Crepe, Clean thin	.07⅜	@	.07⅝
Brown Crepe, specky	.07	@	.07⅜
Liquid Latex, per gal.	.75	@	.85

Paras—

Up-river, fine	.09	@	.09¼
Up-river Medium	Nominal		
Up-river Coarse	.07	@	.08
Acre Bolivian, fine	.09½	@	.09¾
Caucho Ball, Upper	.07	@	.08
Islands, fine	Nominal		

Centrals—

Central, scrap	.06	@	.07
Esmeraldas	.06	@	.07

Balata—

Block, Colombia	Nominal		
Block, Ciudad	.31	@	.31½

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-Mar.		@	3⅞d
Apr.-June	3⅞	@	4d
July-Sept.	4	@	4⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot		@	3⅝d

Scrap

Demand from reclaimers continues to be light, but may show an upturn as the spring season gets well under way. The low quotations for crude rubber are still holding scrap prices down, and the rubber scrap trade is probably as anxious for the success of a restriction program as the plantation industry. Late price quotations for the different grades of rubber scrap follow:

(Prices to Consumer)

Auto tire peelings	ton	21.50	@	23.00
Mixed auto	ton	12.00	@	12.50
Bicycle tires	ton	9.00	@	10.00
Clean solid truck tires	ton	24.50	@	26.00
Boots and shoes	cwt.	1.10	@	1.30
Arctics, untrimmed	cwt.	.90	@	1.00
Inner tubes, No. 1	lb.	.04⅝	@	.04⅞
Inner tubes, No. 2, compounded	lb.	.02¼	@	.02¼
Inner Tubes, Red	lb.	.02	@	.02⅛
Air Brake Hose	ton	10.00	@	12.00
Rubber Hose	ton	9.00	@	10.00

Reclaimed

Some impetus was given to reclaim production and sales during the month, but the gain is considered important principally as being the forerunner of a steady increase through the spring months. Prices, in common with those for crude rubber, have been firm during the past fortnight. Late quotations for the various grades were as follows:

High Tensile				
Super-Reclaim Black	lb.	.07¾	@	.08
High Tensile Red	lb.	.07¼	@	.07½
Shoe				
Unwashed	lb.	.06	@	.06¼
Washed	lb.	.08	@	.08¼
Tube				
No. 1 (Floating)	lb.	.08½	@	.08¾
No. 2 (Compounded)	lb.	.07½	@	.07¾
Tires				
Black	lb.	.05¾	@	.06
Black, selected tires	lb.	.06	@	.06½
Dark Gray	lb.	.07	@	.07½
Light Gray	lb.	.07¾	@	.08
White	lb.	.08¼	@	.08¾
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½
Miscellaneous				
Mechanical blends	lb.	.05	@	.05½

COTTON and FABRICS

Cotton

INDICATIONS that the reduction in acreage this year will prove disappointing have resulted in lowering cotton quotations from 20 to 30 points during the fortnight. The closing price for spot middling upland cotton on March 18 was 10.95 cents a pound as compared to 11.20 cents on the first two trading days of the month.

Authorities in the trade now consider that higher prices for cotton seem more likely to depend upon a substantial increase in the demand rather than upon a drastic reduction in acreage. Whether this demand will eventuate or not remains to be seen, but the long expected improvement in world trade conditions is still very slow in developing.

The high, low and closing prices for the commodity on the New York Cotton Exchange on March 18 were as follows:

	High	Low	Close	Close
	Mar. 18			Mar. 3
Mar.	10.85	10.68	10.85	11.09
May	11.00	10.86	10.99	11.33
July	11.25	11.12	11.24	11.56

Tire Fabrics

Domestic tire factories consumed 15,923,084 pounds of cotton fabric in the manufacture of tires and tubes during January. Late price quotations for the different grades of tire fabric were as follows:

CORD				
Peeler, carded, 23/4/3	lb.	.34½	@	.34¾
Peeler, carded, 23/5/3	lb.	.33	@	.33¼
Peeler, carded, 13/3/3	lb.	.30½	@	.30¾
Peeler, carded, 15/3/3	lb.	.31	@	.31¼
Egyptian, carded, 23/5/3	lb.	.43	@	.43½
Egyptian, combed, 23/5/3	lb.	.47	@	.47½
CHAFERS				
Carded, American, 8 oz.	lb.	.26½	@	.27
Carded, American, 10 oz.	lb.	.26	@	.26½
Carded, American, 12 oz.	lb.	.25½	@	.26¼
Carded, American, 14 oz.	lb.	.25	@	.26
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.26	@	.32
Carded, American, 10¼ oz.	lb.	.26	@	.32
SQUARE WOVEN				
Carded, American, 17¼ oz. 28-11 ply	lb.	.33	@	.33½
Carded, American, 17¼ oz. 10-ply	lb.	.25	@	.25½

Sheetings

Prices on some sizes of sheetings showed fractional increases at the end of the past fortnight. The latest quotations, as reported by the Textile Brokers Association, were as follows:

40-inch, 2.50-yard	yd.	.07½	@	.07⅝
40-inch, 2.85-yard	yd.	.06½	@	.06⅝
40-inch, 3.15-yard	yd.	—	@	.07¼
40-inch, 3.60-yard	yd.	—	@	.06½
40-inch, 3.75-yard	yd.	—	@	.05¼
40-inch, 4.25-yard	yd.	—	@	.05

Ducks

Hose and belting ducks were again stronger in price at the end of the period just past, but other grades showed no change. The market was only moderately strong, with quotations closing as follows:

Belting and Hose	lb.	.24	@	.26
Enameling	lb.	.22	@	.22½
Single filling	lb.	.10	@	.10½
Double filling	lb.	.11	@	.11½

CHEMICALS

MEASURED by the rate of crude rubber consumption, the amount of rubber chemicals and compounding materials used by domestic factories was less in the first two months of 1931 than in the corresponding period of any year since 1924. Even January and February of 1923 saw more activity. The suppliers to the industry may, however, look to better business during the remaining months of the year, one leading tire factory already having announced that it will run at capacity until the close of 1931.

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.14½@	.16
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
Pipsol	lb.	4.30 @	4.50
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.21 @	.23
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.07¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾@	.10
Rub-Er-Red, f.o.b. Easton	lb.	.03¾@	—
Venetian red	lb.	.05 @	.06
Vermillion, quicksilver, English	lb.	1.75 @	1.80
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanium oxide	lb.	.21 @	—
Titanox B, f.o.b. St. Louis,	lb.	.06½@	.07
Titanox C, f.o.b. St. Louis,	lb.	.07 @	.07½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Horsehead Brand:			
Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅜@	.10⅞
blue label	lb.	.09⅜@	.09⅞
red label	lb.	.08 @	.08½
St. Joe, black label	lb.	.06½@	.07
red label	lb.	.06½@	.07
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.06½@	.07
Anaconda, selected lead free	lb.	.07 @	.07½
White seal	lb.	.11⅛@	.11⅞
Green seal	lb.	.10⅜@	.10⅞
Red seal	lb.	.09⅜@	.09⅞
Yellows			
Chrome	lb.	.16½@	.17
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01¾@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.07½@	.07¾
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blacks			
Arrow "Aerofloted"	lb.	.03½@	.08½
Bone Black	lb.	.06 @	.12½
Carbon, compressed	lb.	.03 @	.07
Carbon, uncompressed	lb.	.03 @	.07
Disperso, f.o.b. Louisiana	lb.	.03½@	—
Disperso, f.o.b. Texas	lb.	.036 @	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.03½@	.07½
Excello, compressed	lb.	.04 @	.08
Gastex, f.o.b. Texas	lb.	.03 @	.06
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.03½@	.08½
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.03½@	.08½
Velvetex carbon	lb.	.03 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	8.00 @	20.00
Colloidal	lb.	.05 @	.08
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.25 @	.26
medium white	lb.	.22 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.92
Tale, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.19 @	.22

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.31½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.23
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.08¾@	.10½
Cottonseed, crude		.06⅛@	.07
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.05¼@	.06
Niger	lb.	.05 @	.05¼
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.65 @	.70
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	6.50
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	.10 @	.10½
Alcohol, denatured, No. 1 bbls.	gal.	.40 @	.47
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulphide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.30 @	.35
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.45¼@	.46
wood	gal.	.37 @	.39
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refined, 125/127	lb.	.03¾@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

Agerite, Resin	lb.		
Powder	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

DOMESTIC factories created some surprise by consuming slightly more rubber during February than in the month previous. This is the first time since 1925 that February consumption has exceeed that of January, and this fact has been received as denoting a definite upturn in the activity of the industry. It must still be borne in mind, however, that both February consumption and January and February consumption combined were the lowest for any similar periods since 1924.

American inventories of crude rubber as of February 28 were, as predicted, at a new high record. The actual figure was 212,833 long tons as compared to 209,487 long tons on January 31 and to 134,790 long tons on February 28, 1930. Stocks afloat to this country also experienced a sharp rise, bringing the total visible inventories up to a peak of 276,513 long tons, or practically 75 per cent of last year's consumption.

Warehouse stocks at London and Liverpool have also attained a new peak at 130,106 long tons as of March 14, despite a fire which destroyed 1,154 long tons during the week.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	72,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,343,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	289,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1928:							
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,788	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,793,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,174	1,028,653	14.47	36,819
July	35,182	10,553,944	13.39	2,807	759,260	12.08	32,375
Aug.	35,713	9,666,362	12.08	2,357	655,773	12.42	33,356
Sept.	35,380	8,460,812	10.68	1,514	430,772	12.70	33,866
Oct.	46,069	9,893,980	9.59	2,432	419,325	7.70	43,637
Nov.	29,401	5,700,086	8.66	1,300	271,348	9.32	28,101
Dec.	37,300	7,175,242	8.59	2,168	542,197	11.17	35,132
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.							
Mar.							
Apr.							
May							
June							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1924	1925	1926	1927	1928	1929	1930	1931
Jan.	29,058	29,638	32,196	31,518	34,403	43,002	35,872	28,557
Feb.	25,736	29,761	31,136	30,137	33,702	41,594	32,014	28,797
Mar.	28,385	33,498	32,936	36,141	35,688	44,730	35,134	.....
Apr.	27,129	34,139	32,696	35,871	32,772	47,521	39,333	.....
May	25,845	35,322	29,364	34,592	37,333	49,233	39,035	.....
June	22,753	35,822	28,598	33,801	37,676	48,227	33,890	.....
July	23,396	36,053	27,577	29,219	37,407	41,526	29,245	.....
Aug.	28,982	35,909	34,533	33,460	42,927	38,274	30,575	.....
Sept.	31,497	31,691	32,904	27,214	39,882	34,707	25,288	.....
Oct.	31,520	29,047	29,836	26,790	40,857	34,800	27,271	.....
Nov.	27,289	28,253	28,080	26,792	37,461	27,659	23,479	.....
Dec.	27,199	28,748	26,293	25,492	31,232	23,531	21,493	.....
Totals	328,769	388,481	366,149	371,027	441,340	469,804	372,628	

Figures on Quarterly Basis

Quarter	1923	1924	1925	1926	1927	1928	1929	1930
Jan./Mar.	96,776	87,609	95,263	94,301	99,216	103,558	128,565	101,619
Apr./June	89,493	75,674	104,099	87,109	103,242	103,500	139,292	112,229
July/Sept.	55,621	83,813	99,493	93,793	89,210	117,573	113,746	85,261
Oct./Dec.	63,617	92,656	85,789	83,212	80,860	117,597	84,872	72,020
Totals	305,507	339,752	384,644	358,415	372,528	442,227	466,475	371,120

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1930	1931	MONTHS	1930	1931
January	25,731,000	26,844,000	July	38,256,000	
February	26,509,000		August	37,433,000	
March	31,029,000		September	37,823,000	
April	34,549,000		October	32,267,000	
May	36,497,000		November	30,984,000	
June	35,902,000		December	29,094,000	

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1927																																
November	18¾	18¾	18¾	—	18⅞	—	18⅝	18¾	18⅝	18⅝	—	18¾	18¾	18	17⅝	17⅝	17⅝	—	18	18¼	18⅛	18⅛	18⅛	18¼	—	17⅞	17⅞	17⅞	17⅞	17⅝	17⅝	18¼
December	17¾	—	17¾	17¾	17⅝	18¼	18	18	—	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	—	17⅞	17⅝	17⅝	18⅛	—	18¼	18
1928																																
January	—	18⅛	18⅛	18⅛	18⅛	—	22¼	22¼	22¼	22¼	21	21	—	22¼	22¼	22¼	22¼	—	20¼	20¼	20¼	20½	21⅝	22⅝	22	22	—	—	22½	21⅝	22¼	20½
February	22¾	22	—	21⅞	22¼	22¼	22¼	22¼	22¼	—	—	—	—	—	—	—	—	—	25¼	25¼	25	25½	23½	23	26½	26½	26½	26½	—	—	—	24
March	26	26	26	26	26	26	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	25⅝	24¼	24¼	23	23½	23½	23½	23	22½	22½	22½	22½	—	—	24½
April	23	23¼	22¼	22⅝	22½	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	21¾	21¾	20	19¾	19¾	19¾	20⅛	20⅛	19⅝	19⅝	19¾	19¾	19⅝	19⅝	—	21¼
May	19⅞	19¾	19⅝	19⅝	20¼	21⅛	21⅛	21⅛	21	21	21	21	21	21¼	22¼	22¼	22¼	22¼	23⅝	23½	22⅝	22⅝	21¾	21¾	21¾	21¾	21¼	21¼	21¼	21¼	21¼	21½
June	21¼	21⅛	21⅛	21¼	21¼	21¼	21¼	21¼	21	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20¾	20⅝	20⅝	20⅝	20¾	20¾	20¾	20⅝	20⅝	20⅝	20½	20½	20⅝	20⅝	21¼	20⅝
July	20¾	21¼	21	—	21	21	21	21	21	22	22	21⅝	21⅝	21⅝	21⅝	21⅝	21	21	20⅝	20⅝	20⅝	21	21⅛	21⅛	20	20	20½	21⅛	21⅛	21⅛	21⅛	21¼
Aug.	21¾	21	21	20¼	20¼	21	21	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20¼	20¼	20⅝
Sept.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct.	19⅞	19½	19⅝	19⅝	19⅝	19⅝	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝
Nov.	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Dec.	—	—	16¼	16¼	16¼	16¼	16¼	16¼	—	16⅝	16⅝	16⅝	16⅝	16⅝	—	16¼	16⅛	16	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛
1930																																
January	—	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½
February	15¼	—	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼
March	15⅝	15⅝	—	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
April	15½	15½	15½	—	15½	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼
May	14¾	14¾	14¾	14¾	—	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾
June	13¾	13¾	13¾	13¾	13¾	—	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾
July	12¾	12¾	12	—	12¾	12¾	—	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾	12¾
August	10¾	10¾	—	10¾	10¾	10¾	10¾	—	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾	10¾
September	—	9¾	9¾	9¾	9	8½	7¾	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
October	7⅛	7⅛	8¼	8	7¾	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
November	8¾	—	8¾	—	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾
December	9½	9½	9½	9¼	9¼	9¼	—	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼	9¼
1931																																
January	—	8¾	8¾	—	8½	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾
February	—	7¾	7¾	7¾	7⅞	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾
March	—	7¾	8	8¾	8¼	8¼	8¼	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Month	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24	8.34
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85	7.70
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34	
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93	
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24	
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45	
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24	
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96	
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28	
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	8.20	
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	9.01	
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	9.05	
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	11.98	

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Dec.	Jan.	Feb.	Mar.	Day	Dec.	Jan.	Feb.	Mar.
1	4⅝	—	—	—	17	4¼	4⅛	3⅞	3⅞
2	4¾	—	3⅞	3⅞	18	4½	—	3¾	—
3	4¾	4⅛	3⅞	4⅛	19	4⅜	4⅛	3⅞	—
4	4⅝	—	3⅞	4⅛	20	4⅜	4⅛	3¾	—
5	4⅝	4¼	3¾	4⅛	21	—	4⅛	3¾	—
6	4⅝	4¼	3⅞	4⅛	22	4⅜	4⅛	—	—
7	—	4¼	3⅞	4	23	4¼	4⅛	3¾	—
8	4¾	4¼	—	—	24	4⅜	4⅛	3⅝	—
9	4¾	4¼	3⅞	3⅞	25	—	—	3¾	—
10	4⅝	4¼	3⅞	3⅞	26	—	4⅛	3¾	—
11	4⅜	—	3⅞	4	27	—	4⅛	3¾	—
12	4¾	4¼	3⅞	4	28	—	4⅛	3⅞	—
13	4⅝	4¼	3⅞	4	29	4¼	4	—	—
14	—	4¼	3⅞	3⅞	30	4⅛	4	—	—
15	4½	4¼	—	—	31	4¼	3⅞	—	—
16	4⅝	4¼	3⅞	3⅞					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	Month	1929 Pence	1930 Pence	1931 Pence
Jan.	9.942	7.471	4.160	Aug.	10.505	4.880	
Feb.	11.875	7.948	3.823	Sept.	10.160	4.075	
Mar.	12.135	7.595		Oct.	9.620	4.023	
Apr.	10.490	7.391		Nov.	8.442	4.440	
May	10.717	6.926		Dec.	7.958	4.516	
June	10.580	6.195		Average for Year	10.291	5.926	
July	11.065	5.648					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Feb.	Mar.	Day of Month	Feb.	Mar.	Day of Month	Feb.	Mar.
1	—	—	11	11.00	10.70	21	11.05	—
2	10.45	11.20	12	—	10.80	22	—	—
3	10.50	11.20	13	11.00	10.75	23	—	—
4	10.65	11.30	14	10.95	10.75	24	11.35	—
5	10.80	11.25	15	—	—	25	11.30	—
6	10.75	11.05	16	10.95	10.95	26	11.25	—
7	10.70	11.00	17	11.05	10.75	27	11.15	—
8	—	—	18	11.25	—	28	11.20	—
9	10.70	10.95	19	11.20	—	29	—	—
10	10.90	10.85	20	11.00	—	30	—	—
						31	—	—

Average Monthly Price Per Pound

Month	1929 Cents	1930 Cents	1931 Cents	Month	1929 Cents	1930 Cents	1931 Cents
Jan.	20.22	17.21	10.27	Aug.	18.62	12.03	
Feb.	20.21	15.62	10.96	Sept.	18.83	10.85	
Mar.	20.19	15.13		Oct.	18.46	10.63	
Apr.	20.29	16.39		Nov	17.53	10.96	
May	19.41	16.43		Dec.	17.28	10.02	
June	18.74	14.48		Average for Year	19.03	13.57	
July	18.62	13.10					

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND			AFLOAT			ON HAND AND AFLOAT		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	76,342	126,068	209,487	93,330	65,483	56,187	169,672	191,551	265,674
Feb.	90,058	134,790	212,833	75,790	71,015	63,680	165,848	205,805	276,513
Mar.	100,536	141,843	.....	67,065	63,646	.....	167,601	205,489	.....
Apr.	107,659	148,272	.....	65,798	63,261	.....	173,457	211,533	.....
May	97,192	146,179	.....	65,793	68,168	.....	162,985	214,347	.....
June	92,061	151,485	.....	54,668	58,657	.....	146,729	210,142	.....
July	92,535	152,001	.....	46,145	58,326	.....	138,680	210,327	.....
Aug.	90,769	158,178	.....	49,423	61,168	.....	140,192	219,346	.....
Sept.	84,362	169,607	.....	58,758	60,923	.....	143,120	230,530	.....
Oct.	88,483	184,701	.....	59,180	51,122	.....	147,663	235,823	.....
Nov.	92,219	189,925	.....	62,358	52,538	.....	154,577	242,463	.....
Dec.	118,609	203,221	.....	62,388	56,035	.....	180,997	259,256	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1929	1930	1931	At end of	1929	1930	1931
Jan.	25,191	60,434	81,093	July	30,080	81,048	
Feb.	25,554	64,557		Aug.	35,605	80,931	
Mar.	28,214	68,923		Sept.	42,188	83,329	
Apr.	31,368	74,676		Oct.	47,803	77,647	
May	31,290	77,312		Nov.	52,454	76,887	
June	31,025	80,260		Dec.	54,304	78,013	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1930					
November	77,480	75,159	76,042	76,448	76,670
December	76,877	77,493	77,460	77,328	
1931					
January	78,042	78,761	79,261	80,194	81,039
February	81,183	81,422	82,111	82,185	
March	83,451	83,001			

Stocks in Liverpool

1930					
November	38,941	39,336	40,003	40,492	39,933
December	40,349	40,281	40,300	40,593	
1931					
January	41,516	41,814	42,270	42,171	43,463
February	43,293	43,679	44,555	44,776	
March	45,487	47,105			

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	End of	1929	1930	1931
Jan.	29,617	39,727	49,802	July	33,859	45,459	
Feb.	32,373	44,371	49,283	Aug.	30,834	48,132	
Mar.	29,437	45,657		Sept.	32,138	44,015	
Apr.	26,474	48,473		Oct.	33,770	39,930	
May	30,764	44,715		Nov.	30,963	41,674	
June	30,403	42,451		Dec.	35,543	45,963	

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Feb.	41,955	28,180	2,159	5,000	4,370
Mar.	39,206	27,510	2,220	4,759	4,578
Apr.	39,758	23,580	2,204	4,000	4,482
May	26,482	22,730	2,308	4,000	4,388
June	26,578	20,920	2,316	3,856	4,583
July	38,311	27,290	2,312	4,500	4,665
Aug.	39,432	30,310	2,196	5,200	4,489
Sept.	39,863	31,000	2,343	5,534	4,854
Oct.	38,587	27,630	2,378	5,600	5,156
Nov.	40,551	24,220	2,405	5,400	4,535
Dec.	40,919	25,980	2,569	5,189	5,132
1931					
Jan.	41,620				5,124

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,093	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	28,001,664	66.2	1929	24,141,502	80.3
1926	24,199,524	78.8	1930	17,364,096	80.1
1930			1931		
July	1,449,161	80.7	January	681,301	67.9
August	1,504,187	78.1	February	1,010,774	73.9
September	1,052,109	80.2	March		
October	863,579	73.3	April		
November	920,435	72.2	May		
December	567,355	69.1	June		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944	68,726
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296	69,395
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624	11,838

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,301	4,485	3,675	6,211	4,406	3,744	12,855	11,924	8,957
Feb.	6,479	4,555		4,951	4,195		14,525	11,410	
Mar.	7,049	4,863		6,289	4,717		15,329	12,513	
Apr.	7,391	5,648		6,838	5,089		15,870	13,076	
May	7,636	3,717		6,735	5,216		16,733	13,432	
June	6,847	5,122		6,800	5,294		16,497	13,277	
July	6,320	3,991		7,364	5,447		15,034	11,812	
Aug.	5,693	4,166		7,354	5,175		13,337	10,848	
Sept.	4,460	3,365		5,623	4,405		12,070	9,812	
Oct.	4,611	3,582		4,649	3,499		12,042	9,803	
Nov.	3,378	2,654		3,355	2,834		12,127	9,595	
Dec.	3,057	2,814		3,237	3,361		11,838	9,003	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180	68,529
Shipments	49,673	59,072	63,016	81,004	71,591	72,896	77,127	70,592
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117	12,807

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
Jan.	6,109	4,607	3,623	6,789	4,857	4,062	14,424	12,704	9,439
Feb.	6,346	4,634		4,948	4,337		15,936	13,036	
Mar.	7,000	4,941		6,317	4,727		16,641	13,179	
Apr.	7,157	5,510		6,716	4,848		17,000	13,784	
May	7,181	5,535		6,598	5,074		17,745	13,852	
June	6,542	4,950		6,515	5,265		17,294	13,612	
July	5,793	3,939		7,605	5,855		15,311	11,657	
Aug.	5,481	4,796		7,672	5,762		13,072	10,737	
Sept.	5,190	3,817		5,859	4,541		12,585	10,065	
Oct.	5,000	3,951		4,689	3,472		12,802	10,517	
Nov.	3,544	2,680		3,480	2,788		12,845	10,313	
Dec.	3,484	3,060		3,404	3,412		12,807	9,999	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			Grand Total
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,187	2,237	226,994
Dec.	119,950	92,717	27,233	5,495	4,426	1,069	125,445
TOTAL	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	223,046	187,288	35,758	9,792	6,946	2,846	232,838
Sept.	216,877	175,720	41,157	7,957	5,623	2,334	224,834
Oct.	150,044	112,800	37,244	4,541	3,206	1,335	154,585
Nov.	135,782	102,957	32,785	5,407	3,527	1,880	141,159
Dec.	155,601	124,070	31,531	5,622	4,225	1,397	161,223
Total	3,354,977	2,814,453	540,525	154,192	125,442	28,750	3,509,169
1931							
Jan.	171,903	140,326	31,577	6,496	4,552	1,944	178,399
Feb.							
Mar.							
Apr.							
May							
June							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[3]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,866
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,580
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,638	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	1,059	1,922	788	67,238
June	40,398	14,344	26,054	5,568	1,122	1,061	547	422	5,582	6,693	11,270	757	1,398	548	61,017
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	575	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,998	884	822	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,987	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,683	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	642	386	5,709	7,831	8,928	856	1,837	585	77,628
Feb.	48,947	12,960	35,987	8,055	1,245	847	642	469	6,900	7,191	11,414	944	1,787	480	75,961
Mar.	47,320	12,236	34,084	6,617	1,129	976	642	391	5,796	6,612	11,214	643	1,674	536	70,314
Apr.	43,803	14,627	29,176	4,444	856	1,026	502	366	4,802	6,326	12,724	433	1,201	630	62,486
May	49,016	13,253	35,763	5,968	975	917	502	350	6,352	6,661	12,041	753	1,383	555	72,220
June	36,607	12,120	24,487	4,577	778	1,040	201	392	4,728	4,776	9,512	425	974	551	52,441
July	41,347	12,759	28,588	3,868	792	1,087	600	327	6,022	5,891	9,770	648	810	418	58,821
Aug.	47,802	10,304	37,498	7,077	600	740	600	335	5,892	7,197	9,520	394	809	382	71,134
Sept.	48,529	8,087	40,442	7,966	343	680	600	289	5,960	6,358	7,302	527	1,093	474	72,034
Oct.	47,770	7,312	40,458	7,681	591	598	650	300	5,916	6,956	6,352	667	669	449	71,287
Nov.	41,281	7,774	33,507	6,042	864	631	600*	311	5,334	6,401	8,001	654	658	238	63,241
Dec.	42,086	9,671	32,415	6,934	1,049	976	600*	335	6,254	7,196	8,476	721	1,365	353	66,674
1931:															
Jan.	41,579	11,029	30,554	6,751	.....	770	600*	424	5,923	7,348	10,328	914	994	.....	.....

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, and 2,670 in 1929. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, and 1,302 tons in 1929. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,399
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,436	2,493	2,643	172	—3,807	1,778	589	567	396,012
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,688	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,808
1928	407,572	4,846	36,498	37,355	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,015
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,908	2,727	1,259	684	1,131	627	113	226	115	356	86,270
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,520	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,478
May	48,475	5,112	3,152	3,682	2,987	2,314	1,417	996	1,487	854	201	468	37	277	71,359
June	38,821	4,787	6,314	3,948	3,075	1,598	1,624	695	2,215	672	687	507	24	520	65,882
July	41,114	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	258	519	30	465	68,401
Aug.	35,397	14,594	4,645	4,082	2,879	3,663	908	1,284	724	902	254	429	25	319	70,055
Sept.	32,912	17,010	3,889	4,691	1,908	3,511	1,224	1,235	853	672	253	361	91	477	68,453
Oct.	36,040	16,111	4,489	3,855	1,821	3,902	1,838	1,078	1,125	1,147	278	710	91	201	72,181
Nov.	41,097	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	361	253	595	62	313	72,564
Dec.	40,588	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,709
1930:															
Jan.	44,911	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,949
Feb.	40,792	10,293	4,482	3,697	2,250	1,886	1,385	2,705	457	1,143	188	315	200*	289	69,583
Mar.	42,216	12,346	4,354	4,289	3,776	2,663	1,083	1,153	975	678	358	322	200*	263	74,676
Apr.	43,036	13,058	5,006	4,488	2,303	2,769	2,067	929	673	1,431	158	461	200*	255	76,790
May	40,012	9,861	5,233	4,379	2,593	2,699	1,279	1,645	64	1,250	230	274	200*	282	65,620
June	37,374	9,645	4,458	3,794	2,579	2,677	1,378	1,574	67	691	343	507	200*	282	65,620
July	32,785	7,650	3,311	3,449	3,347	1,206	587	567	84	939	172	756	200*	342	55,395
Aug.	34,513	8,369	3,953	3,515	2,108	2,170	886	149	265	888	87	747	200*	450	58,250
Sept.	34,373	16,015	5,285	4,089	1,578	2,606	1,279	1,373	414	824	221	817	200*	411	69,485
Oct.	44,385	9,095	7,403	3,747	1,942	3,951	2,460	2,782	609	769	439	1,132	200*	351	79,265
Nov.	28,437	—250	13,662	3,074	2,128	4,003	2,510	2,140	464	596	364	1,186	200*	343	58,851
Dec.	35,202	12,249	7,149	3,105	1,347	4,104	2,815	544		814	205	647	200*		
1931:															
Jan.	34,892														

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1929:				
December	2,291,000	14,781,000	3,003,000	4,751,000
1930:				
January	3,281,000	15,470,000	3,496,000	5,169,000
February	3,441,000	14,172,000	2,338,000	5,376,000
March	3,570,000	15,439,000	2,582,000	5,981,000
April	4,029,000	17,762,000	2,593,000	5,989,000
May	3,597,000	15,603,000	1,939,000	6,163,000
June	3,379,000	15,795,000	2,734,000	5,318,000
July	2,940,000	15,117,000	2,663,000	4,910,000
August	3,458,000	13,735,000	1,473,000	4,552,000
September	5,046,000	14,322,000	2,193,000	4,083,000
October	5,209,000	16,460,000	3,056,000	4,186,000
November	2,822,000	11,083,000	1,426,000	3,400,000

(1) Not available; (2) Last 9 months only.

Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,023	3,232	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,235	403,812	—	—
1923	1,155	542,227	700	898,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,385	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,208	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1930:								
Feb.	75	25,956	52	45,319	367	93,087	311	153,843
Mar.	148	50,007	16	12,498	522	128,844	279	107,847
Apr.	75	19,856	58	54,548	410	103,089	226	98,239
May	172	57,760	17	13,645	602	144,415	749	242,385
June	168	51,561	52	47,000	532	120,424	389	129,368
July	93	26,000	24	17,463	45	102,325	242	78,688
Aug.	50	14,000	11	5,600	766	168,511	944	253,127
Sept.	100	28,000	45	39,512	486	86,664	402	127,751
Oct.	64	18,527	36	30,702	490	113,638	306	99,637
Nov.	—	—	73	61,650	389	84,219	332	65,265
Dec.	—	—	90	66,198	429	116,644	70	20,481
1931:								
Jan.	—	—	46	31,870	355	58,897	291	70,708

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

	Production	Consumption Tons	% to Crude	Stocks*		Production	Consumption Tons	% to Crude	Stocks*
Year					Year				
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,884	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	146,808	155,673	39.6	24,008
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,485	47.3	20,680	Oct.	18,865	18,744	53.3	25,117
May	20,585	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,050
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	11,453	10,480	41.4	21,996
Apr.	17,828	16,904	42.0	24,587	Oct.	12,849	10,724	39.3	21,145
May	17,812	17,052	42.7	23,356	Nov.	10,763	8,816	37.5	24,007
June	15,714	14,063	40.3	24,449	Dec.	10,073	8,449	39.3	24,008
1931:									
Jan.	10,349	10,728	37.6	22,429	July	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	Aug.	.....	.....	.....	.....
Mar.	.....	.....	.....	.....	Sept.	.....	.....	.....	.....
Apr.	.....	.....	.....	.....	Oct.	.....	.....	.....	.....
May	.....	.....	.....	.....	Nov.	.....	.....	.....	.....
June	.....	.....	.....	.....	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.

(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

GOVERNMENT CONTROL OF CRUDE RUBBER. By Charles R. Whittlesey. Published by the Princeton University Press, Princeton, N. J. 1931. 250 pp. $2.50.

The scope of this volume is defined and also, unfortunately, limited by its sub-title, *The Stevenson Plan:* data and statistics brought down only to the close of 1928 do not adequately reveal the effects of this British effort at restriction. Even Wallace and Edminster a year earlier in their *International Control of Raw Materials* (Brookings Institution, 1930) were able to offer a picture of the situation after restriction had been lifted and to analyze some of its after effects. As a history of the period from 1922 to 1928, however, Mr. Whittlesey's study is comprehensive and of value as a reference manual, whether or not there can be agreement upon his "theoretical considerations" and conclusions. After presenting the background of the development of plantation rubber, he discusses the movement of prices and the administration of the plan and follows with an investigation of the effects upon the producing countries, the chief consuming country and the investing country. He has exhausted a wide range of sources for his material and his data may be considered authoritative as well as complete, except for certain rare slips such as his citing a news item from this journal of the organization of a company to manufacture mineral rubber as "a typical example of the numerous attempts to produce synthetic rubber" in competition with *Hevea Brasiliensis.*

FUNDAMENTAL AND PRACTICAL ASPECTS OF THE COMPOUNDING AND TESTING OF WHITE RUBBER. By Harlan A. Depew. Published by the New Jersey Zinc Company, 160 Front Street, New York City. 1931. 36 pp. For free distribution.

Dr. Depew introduces his subject with a definition of white and a discussion of the action of pigments and the methods of measuring color. He continues with a treatment of considerations to be observed in the compounding of white rubber—the addition of pigment to uncured rubber, the effect of vulcanization, the choice of white pigments and the choice of organic materials. After studying the general and specific aspects of the discoloration of white rubber, he concludes with pertinent observations on compounding and on practices with particular products.

HARSHAW INDUSTRIAL CHEMICALS. Published by the Harshaw Chemical Company, 1945 East 97th Street, Cleveland, O. 1931. 24 pp. For free distribution.

Basic rubber and other industrial chemicals which this company manufactures, imports or sells as agents for other manufacturers are listed in this booklet, together with details as to containers and standard quantities.

MALAYA RUBBER STATISTICS, 1930. Published by the Department of Statistics, Straits Settlements and Federated Malay States, Singapore, S. S. 1931. $1 (Straits).

During 1929, separate booklets were issued by the governments of the Straits Settlements, the Federated Malay States, and Johore, which contained the results of the rubber statistical work done up to the end of 1928. The present booklet revises and amplifies these statistics and includes returns for the Unfederated Malay States up to the end of 1929, covering acreage, crops, imports and exports. The better coordination of rubber statistical work in Malaya is reflected in this document, tables in which represent the combined work of the Department of Statistics, the Statistical Division of the Department of Agriculture, and statistics officers in the governments of the Unfederated States.

ANATOMIE EN PHYSIOLOGIE VAN HEVEA BRASILIENSIS. By W. Bobilioff. Published by Ruygrock & Company, Batavia, Java, N. E. I. 1930. 288 pp.

A comprehensive and well illustrated discussion of the latex vascular system, the sections related to the numbers and diameters of latex tubes and their effect on latex yield being a review of the Ashplant controversy, is included in this treatise. Dr. Bobilioff was for many years one of the right-hand men of Prof. O. de Vries at the Central Rubber Testing Station in Java.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

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THE MARKET PLACE Section Continued on Next Page

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

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Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

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